

Railway Age Gazette

FIRST HALF OF 1916—No. 22

SIXTY-FIRST YEAR

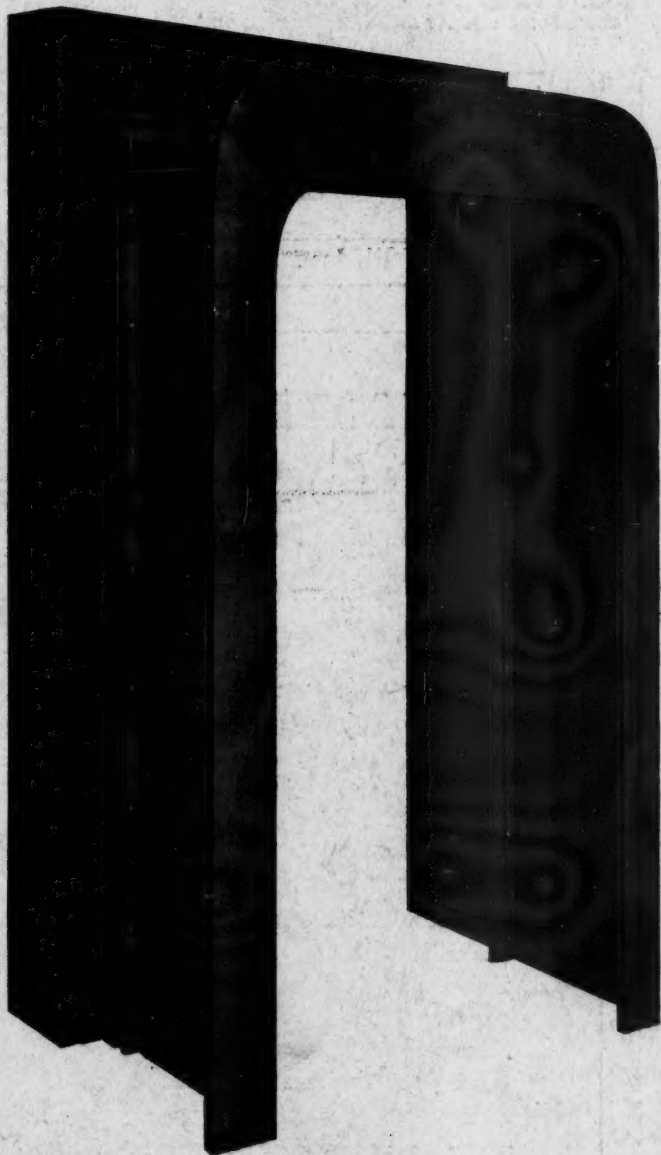
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CHICAGO

Railway Age Gazette

Volume 60.

June 2, 1916.

No. 22.

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With the conferences beginning this week between the National Conference Committee of the Railways and a committee representing the four brotherhoods of train service employees, the controversy over the demand for the eight-hour basic day and "punitive" overtime enters upon a new stage, the outcome of which is difficult to predict. Since the demands were first definitely formulated early in January the dispute has been carried on mainly through the various mediums of publicity. The railways have spared no effort to acquaint the public fully with the points in dispute and the facts bearing upon them, while the brotherhoods have been equally assiduous, if somewhat less frank, in presenting their arguments. Both sides have recognized that the general public has the largest stake in the controversy because it pays the freight and passenger rates from which all wages as well as other railway expenses must be met, and because it would be most vitally affected in case of a strike. Only one side, however, that of the railways, has apparently manifested any concern for the public welfare. Until yesterday the contestants had been dealing at long range. On March 29 committees representing the brotherhoods formally presented their demands and received a formal reply, but except for a brief conference on April 27 to arrange the time and place for the beginning of the negotiations the representatives of the companies and of the employees had not got together in the four months during which the subject has been one of public interest. They are now going through the motions of attempting to adjust their differences across a table, but no one expects them to accomplish anything by it. The positions of the two parties are too far apart to permit of any agreement. In justice to their stockholders, to their other employees and to the public, the railway managers cannot take any other position than to insist that the entire subject be referred to some impartial tribunal that can give adequate consideration to the rights and interests of all concerned. The brotherhood leaders, on the other hand, declare that they will not submit to any arbitration of their demands. To what extent they are bluffing will perhaps be ascertained before many days, but thus far they have insisted that they are so firmly convinced that "the demand is fair" that they decline to take any risk that anyone will disagree with them. In view of the unreasonable character of their proposals it is possible to understand their reason for apprehension, but that they

should have the power to maintain such a position if they are sufficiently reckless to do so represents an intolerable situation which strikingly illustrates the weakness and one sided character of our national methods of dealing with railway problems.

In specifications for the design of railroad bridges, the retarding thrust caused by the application of brakes on trains is commonly taken into account by assuming a force acting in a longitudinal direction at the level of the rails. The magnitude of the force is almost invariably taken at 20 per cent of the live loading used in the design. This requirement has formed a part of such specifications without modification for all of 20 years, and in view of the remarkable improvement in air-brake practice during that time, it is strange that questions are so rarely raised as to the adequacy of this provision either for present conditions, or such as will prevail during the life of a bridge built at this time. It is true that the principles governing the use of brakes to stop trains were so completely and accurately stated by Captain Galton in his report of the historic Galton-Westinghouse tests in 1878, that subsequent experiments have served but to confirm them. It must also be admitted that later developments as to wheels, brake-shoes and rails have not resulted in any material deviations from the values first obtained for the coefficients of friction between brake-shoes and wheels and between wheels and rails. A study of the various brake trials also demonstrates that under ideal conditions it was found possible to use as large a proportion of the maximum coefficient of friction between wheel and rail in the earlier tests as in later ones. There has been little or no change, therefore, as to theoretical considerations. However, owing to the wide range of values for these friction coefficients under varying conditions as to temperature, humidity, speed, time, etc., it has been necessary in actual practice to proportion brakes to develop a retarding force relatively low as compared to the maximum value of the friction between wheel and rail. This has been particularly the case with freight equipment. Development in air-brake practice has, therefore, been directed in a considerable measure to the perfection of improvements which would permit the utilization of higher retarding forces, without danger of slipping, under the complex and variable conditions encountered

in train operation. Among these improvements may be mentioned the high speed brake equipment for passenger trains and the empty and load freight brake. The latter, which was described in the *Railway Age Gazette* in a recent issue, increases the brake power of a loaded car from about 17 per cent of the loaded weight to about 40 per cent. It is evident from the foregoing that the forces exerted in stopping a train with the newest equipment, making due allowances for increased loading, are materially greater than those obtaining at the time that the 20 per cent factor was established for bridge design. This does not mean necessarily that the 20 per cent allowance is now inadequate. On the contrary, there is some reason to believe that it gave an excessive factor of safety for conditions existing at the time it was adopted. Its adequacy for present air-brake practice should, however, be investigated. The modern air-brake is a complex device and its use involves a multitude of varying conditions. The exact nature of the action of bridges under longitudinal thrust is also a matter of considerable uncertainty, involving a consideration of track continuity, multiple spans, expansion joints, etc. The problem is not a simple one, and the subject deserves serious attention.

ECONOMY IN CITY TICKET OFFICES

IN a recent issue of the *Railway Age Gazette* there was published a brief description of a plan adopted by the railroads of Kansas City for doing away with the competition between different roads as to the location of their city ticket offices and thereby effecting a considerable reduction in rentals. In place of each road trying to get a better location than its competitors, and thereby forcing all roads to pay heavier rentals than they otherwise would, the Kansas City lines have entered into an arrangement by which their uptown ticket offices will be located side by side in two adjoining buildings and all will have practically equal facilities in a central district convenient to the public. A similar plan adopted by the St. Louis lines was described in the *Railway Age Gazette* of December 4, 1914, and the same idea has been carried out at Dallas, Oklahoma City and Memphis, resulting in a very material saving to all of the lines concerned.

At both St. Louis and Kansas City the roads have joint ticket offices at the union stations, but efforts to establish a joint uptown office, which would produce an even greater saving than is possible under the centralization plan, have been defeated by failure of the lines to agree on such a plan.

Many railways have recently come to a recognition of the fact that a large part of the expense of maintaining city ticket offices and agencies in towns off the line represents extravagance brought about by competition, which in the long run leaves most of the roads on a practically equal basis. Efforts have been made to secure the co-operation of all roads in an effort to reduce the expense, through the American Association of Passenger Traffic Officers, but the general opinion was that the matter was governed by local conditions in each city and that the best results could be accomplished locally. A committee composed of representatives of each territorial association was appointed to study the question and keep it before the roads, but the progress that has been made is the result of efforts of local committees of roads in the Southwest.

As indicating the economies that can be effected, the St. Louis & San Francisco, which has been steadily working toward a reduction in its city office rents for several years, on July 1 will have reduced its annual rentals in six cities from \$42,500 to \$15,450, a saving of \$27,050, and the maximum amount paid for any of its city offices will be \$3,000. Some of the St. Louis lines by the adoption of the centralization plan, reduced their rentals from amounts ranging from \$10,000 to \$15,000 a year, to \$3,000 to \$4,000 a year, and the saving for all of the lines was about \$100,000 a year.

There are many other cities where a joint office or a centralization plan would result in better service to the public as well as economy to the roads. The committee of the Association of Passenger Traffic Officers is keeping the members advised of the progress made in the Southwest and the results may be expected eventually to influence some of the roads that now are opposed to the idea.

THE BOSTON & MAINE AND JUDGE KNOWLTON

A LARGE committee, representing the directors of the Boston & Maine and of the more important leased roads, has made a new plan for reorganizing the properties. This plan has not yet been formally presented, but in substance it is printed in another column. In its main features it is like what was proposed last year; and now, as then, Judge Marcus P. Knowlton, one of the Federal trustees in control of the New Haven road's stock in the Boston & Maine, comes out with strong objections to the plan. He has issued a statement which we also print. Judge Knowlton's powers of legal reasoning and high standard of ethics give more weight to his statement than would ordinarily be accorded to an opinion held by a single individual in opposition to a large committee. The Springfield (Massachusetts) Republican emphasizes this fact in the amount of space given to Judge Knowlton's opinion (it is published in full in the May 24 issue of that paper) and in editorial comment.

The new plan provides for a new corporation to take over both the Boston & Maine and its leased lines and to issue to the holders of the leased lines' stock new preferred stock on which after three years dividends shall be cumulative at the rate which the leases now call for on the stock of the lessor companies. Judge Knowlton thinks that the reorganization plan is grossly unfair to the Boston & Maine stockholders in that it places on them the burden of making a sacrifice, while it requires no sacrifice on the part of the leased line stockholders and insures to them the same disproportionate earnings of the system which they are now receiving. One cannot help but sympathize with Judge Knowlton's indignation over the fact that the leased line stockholders refused to make any but the slightest concessions; but the question involved is not one dealing with theoretical rights or wrongs but is a plain question of what is the best thing to do in a hard-driven business bargain. What do the Boston & Maine stockholders now actually possess, is the question.

The owned lines of the Boston & Maine total only 707 miles, of which but 525 miles can be called main line. On this mileage there is a funded debt of \$43,338,000, or at the rate of over \$60,000 per mile. The Boston & Maine main lines owned consist of the two lines from Boston to Rigby, Maine, just south of Portland; the line from Worcester, Mass., through Nashua, N. H., and Rochester to Westbrook, Maine, on the Maine Central, a few miles west of Portland; the line from Jewett, east of Portsmouth, to Intervale, N. H., and the line from North Cambridge, just outside of Boston, westward to Northampton, Mass. The Boston & Maine owns only a part of the Boston passenger terminals and only a part of the Boston freight terminals, the Fitchburg and the Boston & Lowell each owning important sections of these facilities. The two lines running to Portland are good passenger lines, but the through freight business is competitive with water borne freight. The other main lines are dependent largely on local freight. The main through line from Canada to Boston is a leased line and the main through line connecting with the New York Central and the Delaware & Hudson, over which the Boston & Maine system's heaviest traffic from the West comes to Boston, is a leased line.

Of the total tonnage carried by the Boston & Maine system about 20 per cent is coal. Less than a proportionate amount of this tonnage moves over the main lines owned. About 20 per cent of the total tonnage of the system is manu-

factures, and again less than a proportionate amount of this traffic moves over the main lines owned.

The facts of the matter appear to be that while a disruption of the system would almost certainly work to the great harm of the leased lines, it would leave the common stockholders of the Boston & Maine less than nothing. Where, of the two different parties to a negotiation, both have something to lose by not coming to an agreement, while one can retain any stake whatsoever only by coming to the other man's terms, the advantage is all on the side of the other man.

Judge Knowlton argues that there is nothing unethical in the Boston & Maine's breaking its leases, because the leases specifically provide that the lessee can then take back his property; and in this he is undoubtedly right. Forfeiture of property pawned does not reflect on the honesty of the pledgor; but if it can be avoided by certain sacrifices the forfeiture may reflect glaringly on the business judgment of the pledgor. The equity which the Boston & Maine common stockholders have today, appears to be an equity in the operation of the system as a whole, and if they are to retain this equity they have got to make the necessary sacrifices. The fact that Lee, Higginson & Co., Kidder, Peabody & Co. and J. P. Morgan & Co. are willing to underwrite the sale of over \$17,000,000 preferred stock and \$15,000,000 bonds is evidence that they believe that under President Hustis' management, with the system continued intact, an equity for the common stockholders can be developed. Judge Knowlton argues that the best that the system can hope to do is to earn the interest on its preferred stock. If that were the belief of the bankers they would certainly not be justified in underwriting the 6 per cent preferred at par.

JAMES JEROME HILL

THE death of James J. Hill removes from the world of American transportation and finance one of the mightiest men who have ever been factors in its affairs. Only J. P. Morgan and E. H. Harriman exercised as great an influence in modern business in this country, accomplished such great things and made such a powerful appeal to the popular imagination. Much time must elapse before the position such men will occupy in history can be determined. But the history of the present does, and that of the future will, bestow less attention than past history on the captains of war and politics, and more on the captains of peace and industry; and in the part of the history of modern times devoted to peace and industry, Mr. Hill will assuredly be given one of the highest places.

He has been familiarly known as the "empire builder" because of his work in opening up the Northwest. He not only built the Great Northern Railway into that territory, but he devoted his great energies and ability to developing its lumber, mineral and agricultural resources, and to settling it with people both from the eastern part of the United States and many of the countries of Europe. His case was a most striking illustration of the fact that the great men of business, in enriching themselves, usually so increase production as to add vastly more to the fortunes of others than to their own.

Mr. Hill was not only the "empire builder of the Northwest," but he was one of the very greatest railway managers that ever lived—in some important ways the greatest. He was the leading advocate, and may be said to have originated, the "tonnage" system of handling freight, which, expressed in other terms, is the system of handling it in the largest practicable train loads. He always maintained that his principles of railway operation were very simple. He said that a railway manufactured train miles, the number of which determined its expenses, and sold ton miles, the number of them it sold determining its earnings. Therefore, the fewer train miles it made, and the more ton miles it sold, the

more net money it would earn. The conclusion from this reasoning was, of course, that the more tons there were moved per train the more prosperous the railway would be—provided, of course, its economies of operation were not absorbed by increases of unit costs or reductions of rates. Within certain limits this philosophy of transportation has been proved, by experience on American railways, and nowhere more notably than on the lines immediately dominated by Mr. Hill, to be sound. He largely increased the economy of operation and the earning capacity of every railway which he controlled. Furthermore, the application of his principles in the development and operation of railways throughout the United States has contributed enormously toward enabling our transportation system as a whole to stand the increasing strain of advancing wages and taxes and stationary or declining rates. Without the big trainload for which Mr. Hill stood, either rates would have had to be greatly advanced within the last 10 years or a large part of all our railways would have become bankrupt.

If any criticism can be made against Mr. Hill as a railway manager it is that there was a time when he put excessive stress on economy as compared with service. Railway efficiency does not consist merely in operating as cheaply as possible. It consists in operating as cheaply as is consistent with rendering good service. But when Mr. Hill became dominant on the Burlington, which was in a highly competitive territory where good service was extremely important, he and his lieutenants showed that they could apply his fundamental principles to a great extent, and still give service that would get and hold for the road its share of the business.

Mr. Hill bore the reputation of being a hard man to work for. He wanted results; he insisted on having them; he was exacting in his demands; and if his lieutenants could not get the results he wanted without working extremely hard, then work that way they must. In consequence, changes in his organization, and especially in the operating department, sometimes came with considerable frequency. But it is a significant fact that no man who ever worked under his immediate direction either stayed with him or left him without crediting him with having those almost superhuman powers of thought and action which his achievements indicated that he possessed; and some of the very biggest railway men in the country worked under him at one time or another. The best test of a man's capacity in his particular line of activity is the opinion entertained regarding him by the successful men engaged in the same kind of work; and certainly there was no question in the minds of the leading railway men of the United States, regarding Mr. Hill's greatness in every branch of railway management.

Mr. Hill formally retired from the chairmanship of the Great Northern some years ago. But a man of his tremendous industry, vitality and interest in affairs could hardly give up business entirely; and it is a well-known fact that he continued up to his last illness to take the keenest interest and to be active in the affairs of all the great properties—railway, banking and of other kinds—with which he had been so long identified.

A few years ago Harriman, Morgan and Hill were the most commanding and dominating figures in the world of transportation. All are gone now. That Harriman and Morgan have been, and that Mr. Hill will be missed, goes without saying. Such extraordinary men always leave a void, even though mankind may try to console itself with the reflection that the world goes on without them. But, while the giants of a past generation are passing away, other men, men of another school, and men some of whom probably are better equipped to solve the problems of present-day railroad management, are rising to take their places. The qualifications for great success in railway development and management have been rapidly and radically changing within recent years. Public sentiment and public regulation must be dealt

with now, as they did not have to be when Harriman, Morgan and Hill were in their prime and at the summit of their power; and while the demand for force, administrative capacity and financial acumen may be no less, the demand for railway diplomacy and statesmanship is vastly greater. The passing of this Titan of the Northwest is an illustration of the fact that we are rapidly leaving the old days and losing the old leaders and passing into a new time and under a leadership new both in its personnel and in its character and attainments.

Mr. Hill, in commenting recently on his own achievements as a railroad man, said thoughtfully that if he were to start over again he would set the mark higher than he did. What a remarkable statement to be made by a man 78 years old, who had developed so greatly the science of economical transportation by railroad. When he undertook to make an analysis of his own great success, at a time in life when men who have lived to see their own achievements work out to fulfillment and to watch the younger generation working out its own problems, Mr. Hill still had the imagination of youth.

His own analysis of his genius as a railroad builder and operator was that he combined minute precision with, as he said, an ability to use the multiplication table. His definition of a great railroad manager was that he should be able to guess right to half a copper cent in the cost of carrying a ton of freight 100 miles. Hill could grasp the innumerable small details that made his guess to half a copper cent right and at the same time hold these details in their true proportionate relation to such vast work of a lifetime as the building of the Great Northern Railroad and the development of the Northwest from a wilderness to one of the greatest wealth producing regions in the world. Combined with the imagination which could see 50 years into the future and materialize the vision was the knowledge of details and the driving force of personality which made it possible for James J. Hill to claim truthfully that when the yardmaster told the despatcher that extra 108 was ready to have the road engine hooked on to her that somebody knew that that engine had its full rating or knew the reason why not. Mr. Hill made the claim only as to the 8,000 miles of railroad that was peculiarly his own—the Great Northern. The principles, however—the Hill principles of railroading—were the same which were being applied by Hill managements on the 9,000 miles of the Burlington and the 7,000 miles of the Northern Pacific, and which were applied by Harriman managements to the Union and Southern Pacific and are just beginning to be applied by railroad managements generally in the United States.

The personality of such a man is almost impossible to describe, as it is quite impossible to fail to immediately recognize it as genius. To use the trite phrase "born leader of men" is an acknowledgment of the failure to describe the qualities which are so unmistakable in the presence of the man himself. The inward necessity for domination in every matter, little or big, is an attempt at such a definition. Smaller men have this quality sometimes to an intensive degree, but it is only the great geniuses who have it extensively, so that the domination carries before it the character of the development of a whole country and the establishment of some great fundamental principles.

Mr. Hill did not discover the principles of the determination of ton-mile costs. These principles were being applied on the Pennsylvania Railroad at the time that Hill was building the Great Northern, but he did apply them in a comprehensive and effective way on a scale on which they have never been applied before. To successfully apply these principles to the operation of 8,000 miles of railroad would in itself have been sufficient to have entitled the name of James J. Hill to rank among the great men of his generation, but the successful management of the Great Northern was only one of a number of activities which are forever to be associated with that name.

Letters to the Editor

NOISE NUISANCE IN SLEEPING CARS

WASHINGTON, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

When I read your editorial in the issue of May 19 entitled "The Hydra Headed Noise Nuisance," I heaved a sigh of satisfaction and took courage in the belief that I might yet live to see something accomplished for the relief of the long suffering sleeping-car passenger. The railroads are not doing all they might do along this line, and the Pullman Company is apparently doing practically nothing. These observations are made after more than fifteen years of railway service and even more years of experience as a traveler in all parts of the United States.

Not all of the noise, by any means, comes from the outside of the car, as you well know from your own experience as a traveler. I am a sound sleeper, usually sleeping better on the train than elsewhere, but recently in a single night's ride I was wakened seven times; twice by rough handling of the train on the part of the engineman, twice by the porter, instructing a new man, and three times by arriving and departing passengers. To give the passenger the quiet to which he is entitled means a long campaign of hard work on the part of the Pullman Company, to say nothing of some skillful instruction of porters in tact and diplomacy; but I believe that it is worth trying. Will somebody second the several suggestions I have already made to the Pullman Company?

W.

WAGES AND RESPONSIBILITIES OF THE CAR INSPECTOR

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In view of the demands made by the enginemen and trainmen for an eight-hour day, or in other words, an increase in pay, it is most logical that a comparison be made at this time of the responsibilities and wages of the engineer, the conductor and the car inspector.

The engineer is first called to take his run. He receives his engine all ready to go, with the exception of the necessary oiling which he does. He then takes the engine to the train, couples on to the train, charges the brake system with air and applies the brakes when signaled to do so by the car inspector. He compares his watch with the conductor's and reads over his train orders. He is then ready to start. He has the time card, train orders and block signals to guide him to the end of his run. He is paid from \$150 to \$250 per month for his services and he must take the train through safely.

The conductor is called to take his train. First he checks the cars in the train; that is, he takes the car numbers and checks the register, compares his watch, receives and delivers the train orders to the engineer and then he is ready to leave on his run. He also has the time card for his guide; he collects the tickets and sees that the passengers are discharged at the proper places. He receives about \$150 per month for his services of from four to five hours per day, the same as the engineer.

The car inspector begins his work at 6 a. m. or 6 p. m., whichever the case may be, and works until 6 p. m. or 6 a. m., a period of 11 or 12 hours. He must thoroughly inspect and pass judgment on all passenger cars in each train as to whether or not they are safe to carry their human freight. The entire responsibility for the condition of the train rests on the inspector, such as respecting sound wheels, truck hangers, arch bars, brake hangers, couplers, all safety ap-

pliances, steam heat, air brakes, the condition of journal bearings, oiling, etc. He works from two to three times as many hours as the engineer and conductor and receives for his services from \$75 to \$85 per month of 30 or 31 days, which is about one-half the conductor's pay and one-third the engineer's pay.

I claim that the pay of these different men should be equalized, as the car inspector has as much responsibility as the men in either of the other two positions mentioned. While it is true that the engineers and conductors are required to take an examination on transportation rules, etc., the car inspector, on the other hand, is required to take examinations on the M. C. B. interchange rules and loading rules, U. S. safety appliance rules, and air brake rules. This has all to be kept up, along with his long day's work, and it takes from three to four years to make a good car inspector, as he must be trained.

A CAR FOREMAN.

THE AMHERST COLLISION

SOUTH COFFEYVILLE, Kan.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your editorial on fog, anent the Amherst collision, covers the main problem raised by that collision, but it will not be amiss to examine for a moment some of the side issues.

This disaster reinforces, by actual bloody demonstration, the lesson, set forth many times in your columns, and made prominent at Milford, Conn., and again at Bradford, R. I., that the flagman is no satisfactory reliance. The officers of the road and the safety specialists of the commission can point out, in one place or another, where a flagman wasted a minute, or a half minute, or possibly two minutes, and gravely observe that if he had done just the right thing the collision would have been averted; but the fact remains that, after what are said to have been reasonable efforts at enforcement of the flagging rule, the flagging rule was not carried out. These flagmen at Milford, at Bradford, and at Amherst were good, average flagmen. The officers of those roads are probably fully up to the average standard. No government, no authoritative body that we know of, can do anything effective to secure any better enforcement of the rules than this. The margins of time available in flagging are too small. There are too many questions, requiring to be settled on the spur of the moment, which flagmen are not competent to deal with. And even if the flagmen did settle them and carried out the rule to the limit, the result would be intolerable. The delays to trains, the expense for fuses, the extra cost of flagmen, the constant disturbance of the whole countryside by explosions of torpedoes and interminable calling-in whistle signals, would make the railroads of the country a disgrace to civilization.

Incidentally, the Amherst report shows the inadequacy of a five-minute fuse. It burned out and the train passed it; a six-minute interval did not prevent the collision. And what about torpedoes? On the New York Central lines west of Buffalo their use seems to be discouraged. Everywhere else, so far as I have heard, they are used very liberally. A noise has elements of efficiency not present in any visual signal. With this diversity of practice, what becomes of all our beautiful theories about the value of uniformity?

One more thing I wish to point out in connection with the Amherst report; the reference to the record of Engineman Hess. Five derelictions, scattered over 15 years, are said to be the "more serious entries" in his record. But what are the less serious ones? The fact that he got by a caution and a stop signal indicates that he *might* do a lot of efficient service while still indulging in some careless habit or habits. Men who have made good records by good luck are known to all of us. One important and fundamental means of inculcating correct habits in important matters is to constantly require good habits in small matters. By that means mental efficiency is taught. The commission has not given us the

full lesson of Engineman Hess' breakdown until it has told us all that it can tell us about his habits and conduct in the past.

H. S. E.

A THREE-POSITION TRAIN-ORDER SIGNAL

ST. PAUL, Minn.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The Standard Code of train rules now, as before the recent revision, provides for only two aspects of the train order signal, namely, "stop" and "proceed" (Rule 221); while yet, by implication, the practice of delivering certain orders to a train without stopping it is authorized (see Rule 211). Therefore, if we use form 19 for orders, and follow the standard code we are under the necessity of giving a stop signal to a train that we do not desire nor intend shall be stopped; and it is necessary to supplement this signal, in some way not specified, to modify the indication.

The Northern Pacific has used for more than ten years a three-position train order signal and for the past four years has used form 19 for restricting as well as for assisting orders. Under the rule the three aspects of the signal convey definite information to the train as follows:

Horizontal or red: Train orders requiring your train to stop. These may be form 31 or form 19.

Diagonally upward, or yellow: Train orders, form 19, that do not restrict your rights at this point and do not require you to stop, provided the orders are delivered to you.

Vertical, diagonally downward, or green: No train orders for your train.

The diagonally upward or yellow aspect is just as positive a command to the train crew as the horizontal or red aspect. It is, of course, necessary that the signal be positively identified as being a train order signal. In working this out it was necessary to frame a rule, as no precedent was found.

The practice under these rules has now been tried out for four years with complete success. It is in the nature of a logical development and therefore should be specifically authorized in the standard code.

I quote the rules bearing on this subject, both standard code and those of the Northern Pacific:

NORTHERN PACIFIC RULES

208-a.—Meeting orders, or orders conferring rights to the point where placed, must not be addressed to the trains of superior right, at the point of execution, if it can be avoided.

When it cannot be avoided, special precaution must be taken by the train dispatchers and operators to insure safety, and the following notice will be incorporated in the order: "..... gets this order at....."

221-b.—A fixed signal must be used at each train order office, which shall indicate "stop" when trains are to be stopped for train orders (except as provided in rule 221-c). When there are no orders the signal must indicate "proceed."

When an operator receives the signal "31," or "19," followed by the direction, he must immediately display the "stop signal" or "caution signal" for the direction indicated and then reply "stop displayed" or "caution displayed," adding the direction; and until the orders have been delivered or annulled the signal must not be restored to "proceed." While "stop" or "caution" is indicated trains must not proceed without a clearance card, Form A, . . .

Where the semaphore is used, the arm indicates "stop" when horizontal, "caution" when diagonally upward and "proceed" when vertical, or diagonally downward.

221-c.—Where a three-position semaphore is used the "caution" position may be used for "19" train orders except when the order is addressed to operator at the meeting or waiting point, as provided in Rule 208, or when the order restricts the superiority of a train and is sent to it at the point where such superiority is restricted. In such cases the train dispatcher must instruct the operator to display the "stop" signal.

STANDARD CODE

No corresponding rule in Standard Code.

221-b.—A fixed signal must be used at each train order office, which shall indicate "stop" when trains are to be stopped for train orders. When there are no orders the signal must indicate "proceed."

When an operator receives the signal "31," or "19," followed by the direction, he must immediately display the "stop signal" for the direction indicated and then reply "stop displayed," adding the direction; and until the orders have been delivered or annulled the signal must not be restored to "proceed." While "stop" is indicated trains must not proceed without a clearance card, Form A, . . .

Where the semaphore is used, the arm indicates "stop" when horizontal and "proceed" when in a vertical or diagonal position.

A. M. BURT.

THE SOUTH CHENEY COLLISION

BENNINGS, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The report of the Interstate Commerce Commission on the collision at South Cheney, Wash., just issued, embodies a most instructive illustration of the futility of trying to run railroad trains in this enlightened year of our Lord one thousand nine hundred and sixteen, without the use of the space interval. We make blunders enough, in all conscience, with the block system; but without it we drop back to the conditions of 1905, when, according to the government report for the twelve months ending with June 30 in that year, 198 passengers and 410 employees were killed in collisions in the United States; and that was a year when the number of passengers carried on American railways, measured by the passenger mileage, was only about two-thirds what it now is. As fairness requires that I give the devil his due, I must say that two of the collisions in this annual report, one killing 16 persons and the other killing 8, occurred under the block system.

Just look at the situation at South Cheney.* The Northern Pacific trains were detoured over another road for a distance of over a hundred miles, yet they had no pilots. It is said that these trainmen had been running over the Spokane, Portland & Seattle several days; but what is such a short period? What part of the hundred details that a locomotive runner should be familiar with can be acquired in that time? And, according to the map, these roads are not parallel lines, like some of those on the prairies of the Central West, where everything is easy.

An incidental light on the method of train management is shown in the statement that these trains returned to their own line at a junction which was eight miles from the nearest registering station.

These trains, running on an unfamiliar road, received in their run of something over one hundred miles *nineteen* train orders, many of them slow orders for bad track. When one reads of practice of this kind he is inclined to question whether the aim of the management is to promote safety or to give conductors and enginemen a chance to earn prizes for their ingenuity and mental ability in carrying a dozen different important facts in their minds at one time.

Then look at the testimony about the fog. The government investigator says that it was dense; yet one of the witnesses quoted by him, a Miss Putnam, who was walking along a road 1,000 feet from the track, saw the flagman go back. What is the measure of density under which such confusing statements are made? Again, it is said that the conductor of the leading train, while the train was standing at the station, came out of the office, looked west and saw the flagman going back and the following train coming.

It is plain that the problem of investigating fog conditions, more than an hour after the occurrence, is likely always to be difficult. This is one strong reason why the investigation of collisions will always be perplexing, and why the system of train management should be made as simple as possible. In passing, it is to be noted that in adopting the block system we are doing this thing; we are taking the most effective measures to promote simplicity. Block signals are set in fixed locations, close to the track. And, with posts not over 25 ft. high, an engineman well acquainted with the road on which he is running is reasonably well equipped to cope with the fog problem. And, with white board fences, suitably located and of varied height—changing from low to high, higher and highest as the distant signal is approached, we may provide all needful landmarks.

In this report we see what a mere makeshift the fusee is. The flagman of train No. 42 had thrown off, in 130 miles, eight or more fusees; one 26 miles from the place where he

started; one 38 miles, one 45 miles, one 61 miles, one 80 miles, one 105 miles, one 119 miles, another at a point where there was a broken rail, and others at unnamed places. And yet at the vital point, where the fusee was most needed, he did not use one. One of the fusees, in the belief of the investigator, was passed by the following train without being seen.

Can anyone say that the failure of the flagman to throw off a fusee approaching South Cheney affords positive evidence that he is blameworthy? If he says that he used his best judgment, it is not for me to question him. I do not know as the government can question him; certainly it cannot do so to any profit. The fact is that flags and fusees combined afford but a broken reed for "safety-first" to lean upon.

Another incidental evidence of confusion in operating methods is to be seen in the statement, at one point in the report, that a "clear block" was given, although there was no block system in use. At another place the station operator's record is referred to as the "block sheet." This is not an unheard of mistake, for railroads have reported to the government, on official forms, that they used the block system when they did not.

The South Cheney report quotes certain rules of the Spokane, Portland & Seattle and refers to the Northern Pacific trainmen's familiarity with the rules—or their unfamiliarity—and yet no evidence is presented that these men were ever thoroughly examined, or examined at all, on these rules. The superintendent of the Northern Pacific "understood" that his men had been examined on the rules of the other roads.

The testimony in this report, as is usual in such cases, contains underestimates of the speed of trains, given by the men responsible for excessive speed, and no comments on the situation. The operator at Amber was working his third night at that place. Perhaps the newness of this operator had nothing to do with the cause of the collision, but the incident illustrates how our high ideals about experience, training and full acquaintance with every detail of work—as essential elements in the perfectly equipped signal man—fall down when they come to be applied in real life.

The superintendent of this division had been in that office only four months. He is not to be criticized for this, surely; but who knows how many collisions have been prevented by the fact that the superintendent of the road, possessing the knowledge acquired by long acquaintance, had checked some incipient error?

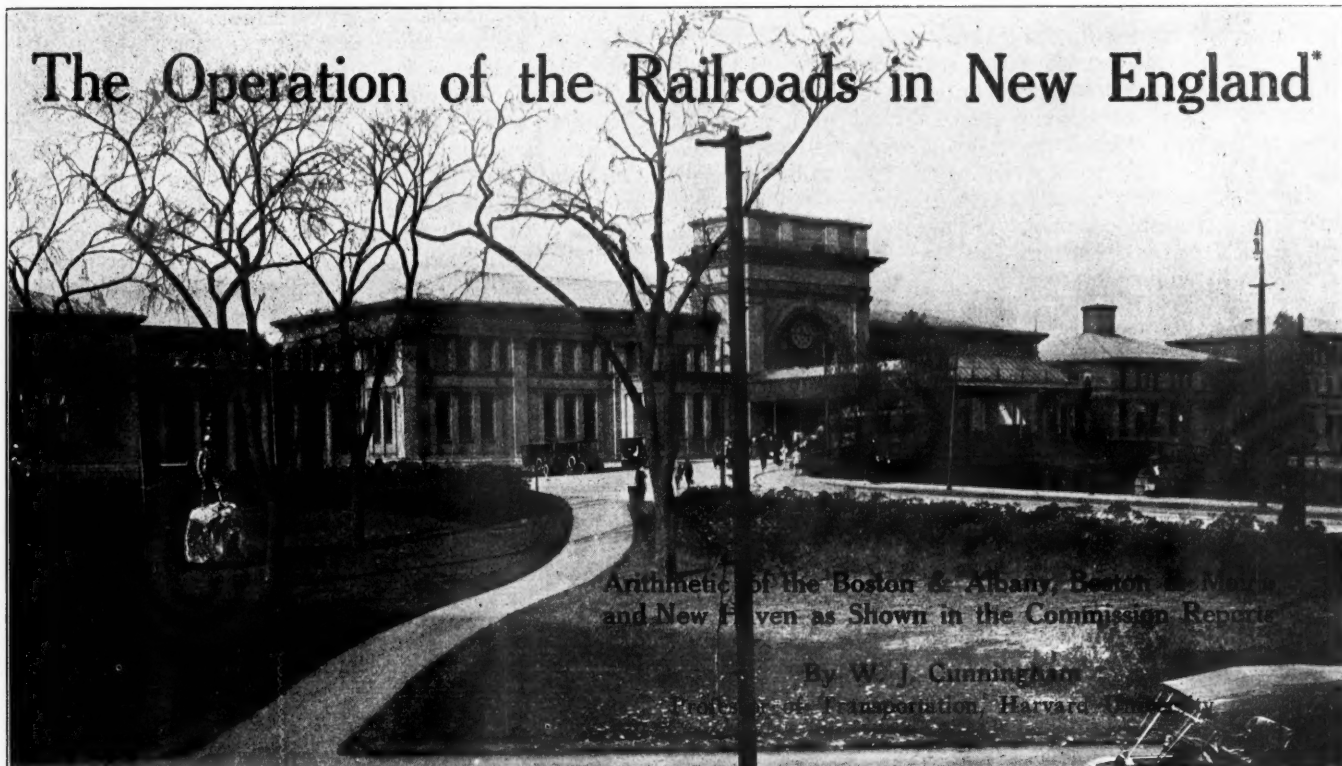
The Spokane, Portland & Seattle book of rules—which, by the way, according to the rule numbers, is not the Standard Code—still has in it the five-minute rule for spacing trains. This is superseded by a circular making the interval ten minutes; and no one can say that the ten-minute rule is not well understood; nevertheless the presence in a book, a book which is frequently referred to, of a rule which does not belong there, does not indicate the highest kind of efficiency.

On this showing of loosely enforced rules; of rules that are of doubtful utility even when enforced as well as they can be enforced, and the utter unreliability of the time interval method of spacing trains, it is not to be wondered at that the Commission ends up with the declaration that it is "advisable" to use some form of block system. But one does wonder—wonders what standard of efficiency prevails in the Interstate Commerce Commission—when he reads this mild word—"advisable"—and in connection therewith recalls that the Commission has been advocating the making of the block system compulsory by law in nearly or quite every one of its annual reports for a dozen years past. Instances of fast passenger trains overtaking slower passenger trains, with disastrous results, while the ten-minute interval rule was being enforced as well as was practicable, were published in the accident bulletins of the Commission several years ago.

I. C. E.

*The principal facts were given in our report printed May 26, page 1130.—EDITOR.

The Operation of the Railroads in New England*



Arithmetic of the Boston & Albany, Boston & Maine, and New Haven as Shown in the Commission Reports

By W. J. Cunningham

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New Haven Station at Providence, R. I.

THE object of this paper is to call attention to the wealth of interesting statistical information, relating to the railroads of New England, which lies dormant in the published returns of the Public Service Commission of Massachusetts and of the Interstate Commerce Commission. Outside of the executive and accounting departments there is little conception in railroad circles of the mass of statistical detail required by the several commissions, and the public reports are so voluminous and are so old when they appear that they fail to interest those in railroad work who have a little more than they can do to keep abreast of the times. Consequently, as a rule, little use is made in railroad circles of the valuable information of a comparative nature with which the published reports abound.

In this paper the writer has attempted to make a comparison of the principal physical, traffic, operating, and financial characteristics of the three principal railroads of New England, viz.: the Boston & Albany, the Boston & Maine, and the New York, New Haven & Hartford.

When the results of one railroad are compared with those of another, the statement is frequently made that the comparison is unfair or is meaningless because of differences in traffic or operating conditions. To a certain extent all such comparisons may be misleading without a complete knowledge of local conditions and all related factors, and in many instances it is impracticable statistically to appraise such differences exactly. Yet, notwithstanding this inherent difficulty, it is interesting at least to attempt to find a common denominator by which the many units of public service, revenues, expenses, and net returns may be measured in comparative terms. Various bases are suggested in this study.

The logical arrangement for a comparison would appear to be:

(1) *Physical characteristics*, i. e., the length of the road; its percentage of multiple running tracks, yards and sidings; its gradients and curvature; its bridges, trestles, culverts and signals.

(2) *Equipment characteristics*, i. e., the complement of locomotives and cars; the weight or tractive power of locomotives; the capacity of cars.

(3) *Traffic characteristics*, i. e., the volume or density of traffic; the relative proportions of passenger and freight business; the character of the tonnage; the character of the passenger traffic.

*Abstracted from a paper read before the New England Railroad Club, May 9, 1916.

(4) *Operating characteristics*, i. e., the train mile density; the ratio of locomotive miles to train miles and of switching miles to total locomotive miles; the car load and the train load; the percentage of empty freight car movement; the efficiency of freight car utilization.

(5) *Revenue characteristics*, i. e., the average receipts per passenger or per passenger mile and per ton or per ton mile; the average haul; the division of operating revenues.

(6) *Operating costs*, i. e., the division of operating expenses; the operating ratio; the influence of traffic factors; the unit costs of maintaining track, structures and rolling stock; the unit costs of operating stations, yards and trains; the unit costs of casualties, including freight claims.

(7) *The income account*, i. e., earnings, expenses and net revenue, taxes, gross income and net income on a per mile of road basis; the relations between net income and rentals of leased line; the effect of the hire of equipment accounts; the relation between net corporate income and capital stock.

PHYSICAL CHARACTERISTICS

We are interested in ascertaining both how long and how broad the road is. In order to compare the three roads on a uniform basis the tabulation which follows shows the road mileage as 100 per cent and the extent of multiple running tracks, yards and sidings in percentages of road miles.

TRACKAGE DENSITY (1915)

	B. & A.		B. & M.		N. Y., N. H. & H.	
	Track miles	Per cent of road miles	Track miles	Per cent of road miles	Track miles	Per cent of road miles
Road miles	393	100.0	2,302	100.0	2,003	100.0
Second track miles	219	55.7	591	25.7	835	41.7
Third track miles	84	21.4	8	.3	130	6.5
Fourth track miles	25	6.4	2	.1	129	6.5
Fifth track miles .....	...	...	...	...	10	.5
Sixth track miles .....	...	...	...	...	10	.5
Miles of yards and sidings...	412	104.8	1,354	58.8	1,418	70.8
Total track miles	1,133	288.3	4,257	184.9	4,535	226.4

These figures are to be related to traffic density, train density, operating costs and operating efficiency. The Albany stands first in trackage. More than 55 per cent of its line has double track; more than 21 per cent has a third running track on ascending grades, and it has slightly more miles of yards and sidings than mile of road. Altogether, it has 2.88 miles of track to every mile of road. The New Haven comes next with more than 41 per cent double tracked; over 6 per cent with third and fourth running tracks; and 0.5 per cent with fifth and sixth tracks. In total trackage, it has 2.26 miles of track to each mile of road. Having a greater num-

ber of branch lines than the Albany, its trackage density is relatively less. The Boston & Maine, with its relatively high proportion of branch line mileage, stands third in trackage density. Only one-quarter of its road is double tracked, and its third and fourth trackage is negligible. Inadequate, too, is its mileage of sidings and yards, there being little more than half a mile of such trackage for every road mile. Altogether, it has 1.85 track miles to one road mile.

Our next inquiry concerns vertical and horizontal alinement, so that we may compare the physical handicaps under which each road is operating. The 1914 figures are the latest available in public documents.

CURVATURE AND GRADIENTS (1914)

	B. & A. Per cent of road miles	B. & M. Per cent of road miles	N. Y., N. H. & H. Per cent of road miles
Per cent straight line.....	58	64	66
Per cent curved line.....	42	36	34
Per cent level line.....	9	16	17
Per cent line with grades.....	91	84	83
Average rate of all grades in feet per mile..	32.1	31.7	27.5

The figures indicate that the Albany suffers the greatest handicap in curvature and rise and fall. Only 58 per cent of its line is straight and only 9 per cent level. Its average rate of grade for all rise and fall is 32.1 ft. per mile. The Boston & Maine comes next in curvature and gradients, whereas the New Haven is the most fortunate in these respects. These physical factors have a direct bearing on the trainload and on maintenance and train expenses.

Next in order we may examine the frequency and length of bridges, trestles and tunnels.

BRIDGES, TRESTLES AND TUNNELS (1914)

	B. & A.	B. & M.	N. Y., N. H. & H.
Bridges, number of.....	223	1,331	1,729
Average length (ft.).....	71.5	65.1	72.1
Miles of road to one bridge.....	1.8	1.7	1.2
Trestles, number of.....	6	241	147
Average length.....	350.7	166.4	193.3
Miles of road to one trestle.....	65.5	9.2	13.6
Tunnels, number of.....	2	4	6
Average length.....	319.5	6,903.0	1,777.5
Miles of road to one tunnel.....	196.1	555.7	332.1

The New Haven has relatively the greatest number of bridges, and their average length is greatest. The Boston & Maine comes next in the frequency of bridges, but their average length is somewhat shorter than the average bridge on the Albany. The Boston & Maine, however, has by far the greatest number of trestles, with the New Haven second. The difference between these two roads and the Albany is accounted for by their greater proportion of branch line mileage and by the proximity of their lines to the sea shores. In tunnels, the Boston & Maine with its long Hoosac tunnel (nearly five miles in length) suffers the greatest handicap. While it has four tunnels in all, the others are comparatively short. The New Haven has six tunnels, each averaging 1,777 ft. in length. The Albany has two short tunnels at State Line, each averaging 319 ft.

The extent to which a line is signaled, and the type of signal, have bearing on maintenance of way and transportation costs, as well as upon the capacity of the road. The adequacy of signals has a relation also to the regularity and safety of train operation.

SIGNALING (1915)

	B. & A. (357 miles)	B. & M. (2,213 miles)	N. Y., N. H. & H. (1,888 miles)
Automatic block signals (road miles).....	211.8	1,133.6	346.2
Non-automatic block signals (road miles)....	.6	.....	1,418.6
Total block signals (road miles).....	212.5	1,133.6	1,764.8
Per cent of road with automatic block signals	59.3	51.2	18.3
Per cent of road with non-automatic block signals.....	.2	.....	75.2
Per cent of road with automatic and non-automatic block signals.....	59.5	51.2	93.5
Interlocking plants, number of.....	42	57	276
Average levers per interlocker.....	34	33	20
Average road miles per interlocker.....	8.5	38.9	6.8

In automatic signaling the Albany shows the highest percentage of passenger operated road so protected, viz.: 59.3

per cent. Next comes the Boston & Maine, with 51.2 per cent of its passenger operated road thus equipped. The New Haven has the smallest percentage protected by automatic signals.

Neither the Boston & Maine nor the Albany (with the exception of one-half mile within yard limits on the latter) has any non-automatic block signaling. They depend entirely upon automatic signals and they are near the top of the list of roads well protected in that respect. The New Haven, however, has a large proportion of line protected by manual control blocking, which is classed as non-automatic. The 1914 report shows 462 miles of road so equipped but in the 1915 report this is increased to 1,418 miles.

EQUIPMENT CHARACTERISTICS

The Albany has relatively the greatest number of locomotives, as well as the most powerful. It has 98 locomotives per 100 miles of road; the New Haven has 63; and the Boston & Maine has 52. The average locomotive on the Albany weighs 74 tons on the drivers and has a tractive force of 31,580 lb.; for the Boston & Maine, the average weight on drivers is 57 tons and the average tractive force is 24,851 lb.; for the New Haven, the average weight on drivers is 53 tons and the average tractive force is 24,527 lb. The preponderance of passenger traffic on the New Haven accounts in part for its low average tractive effort. The Albany figure, on the other hand, is influenced by the few heavy Mallet compounds and by the modern and relatively heavy double-end locomotives used in suburban service.

EQUIPMENT CHARACTERISTICS (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Locomotives per 100 road miles.....	98	52	63
†Average weight on drivers (tons).....	74	57	53
†Average tractive force (lb.).....	31,580	24,851	24,527
Passenger train cars per 100 road miles....	116	86	123
Average seats per passenger carrying car....	67	67	71
Freight train cars per 100 road miles.....	2,109	1,036	1,712
Average capacity per car (tons).....	41.4	31.1	33.0

† Steam locomotives only.

The New Haven has the greatest number of passenger train cars. In 1914 the New Haven and the Albany stood alike (118 per 100 miles of road), but the New Haven has recently added to its equipment through the purchase of many new steel coaches. At the end of the last fiscal year (1915) the New Haven had 123, the Albany 116, and the Boston & Maine 86 passenger train cars per 100 miles of road. The New Haven cars are shown as having a greater seating capacity than either of the other two roads.

The Albany stands first in freight car equipment, with 2,109 cars per 100 miles of road. The New Haven has 1,712 and the Boston & Maine 1,036. The Albany's greater proportion of modern coal and flat cars accounts for its greater average capacity per car, viz., 41.4 tons, as against 33 tons on the New Haven and 31.1 tons on the Boston & Maine.

The character of the locomotives and cars is to be borne in mind when comparison is made of train and car performance and maintenance costs. They have a bearing as well on the cost of track maintenance, since the character of roadway, track and structures maintenance must be made to conform to the demands of the heaviest locomotive.

The traffic burden which the road is called upon to bear may be expressed clearly in terms of traffic density, that is, the average number of passengers and tons which move over each mile of road during the year.

TRAFFIC DENSITY (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Passenger miles per mile of road.....	808,607	377,472	737,828
Ton miles per mile of road.....	2,659,520	1,073,175	1,090,918

The Albany has the greatest passenger density, in fact it is exceeded in that respect by only one railroad in the United States,—the Long Island. The New Haven is not far behind the Albany. The Boston & Maine passenger density

is low compared with the other two roads, yet it is more than $2\frac{1}{2}$ times the average for all roads in the United States. The New England railroads are in a class by themselves with respect to passenger density. The South Station in Boston handles more passengers per year than any other railroad passenger terminal in this country, and the passengers through the North Station in Boston exceed those which pass through either the Grand Central or the Pennsylvania stations in New York or any station in Chicago.

The Albany holds the premier position in New England in ton mile density as well as in passenger mile density. Next comes the New Haven and then the Boston & Maine. Taking all roads in the United States as one system they carry two tons of freight to one passenger. On the New Haven there are nearly four passengers carried to one ton of freight. This striking fact illustrates the fundamental difference in railroad traffic between New England and the country at large.

In comparing the traffic density of the three roads under comparison, the extent of trackage should not be overlooked.

The road with the greatest proportion of coal and other mine products, lumber, and other low grade heavy commodities, has an advantage in car load and in trainload which is not enjoyed by the road which has a large proportion of merchandise and other high grade freight, moving in light car loads. Conversely, the preponderance of low grade freight brings a relatively low revenue per ton and per ton mile.

CLASSIFICATION OF TONNAGE (1915)

	B. & A. Per cent	B. & M. Per cent	N. Y., N. H. & H. Per cent
Products of agriculture	15.0	15.9	10.0
Products of animals	8.8	3.9	3.2
Products of mines	34.6	25.9	29.1
Products of forests	3.7	14.1	5.1
Manufactures	34.7	20.7	22.2
Merchandise and miscellaneous	3.2	19.5	30.4
Total	100.0	100.0	100.0
Per cent of tonnage originating on road..	25.8	36.2	41.6

The Albany enjoys the largest percentage of mine products. It has also a fairly large percentage of products of agriculture, mostly grain, which move in good car loads. Its percentage of manufactured goods, merchandise and l. c. l. freight, on the other hand is relatively low. The New Haven is not far below the Albany in coal tonnage but it carries little grain, and its percentage of manufactures, merchandise and l. c. l. freight is unusually high. Manufactures and merchandise make up 52.6 per cent of the total, as compared with 37.9 per cent on the Albany. The Boston & Maine has relatively the smallest proportion of coal tonnage. Its volume of grain is almost the same as that of the Albany and its manufactures and merchandise traffic is slightly more. It exceeds both the Albany and the New Haven in its proportion of products of forests.

The New Haven is unique in its large proportion of tonnage originating on its own line. It originates 41.6 per cent while the Albany shows only 25.8 per cent, and the Boston & Maine 36.2 per cent.

REVENUE TRAIN MILE DENSITY (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Passenger train miles per mile of road.....	10,366	4,918	7,498
Freight train miles per mile of road.....	7,823	3,123	3,183
Mixed train miles per mile of road.....	242	95	91
Special train miles per mile of road.....	6	19	3
Total train miles per mile of road.....	18,437	8,155	10,775
Ratio of revenue switch locomotive miles to revenue train miles (excluding motor car trains) per cent.....	1.14	1.11	1.14
Ratio of revenue switch locomotive miles to total revenue locomotive miles.....	21.5	22.8	17.0

Where, as in the case of the New Haven, such a large part of the traffic originates on the road, the natural consequence is greater car detention and a low average mileage per car day.

Next in order come the statistics of train mile density,

i. e., the number of trains which move over each mile of road per year.

These figures correspond roughly with the passenger and ton mile density, in fact, were the trainload the same in each case the train mile density would be exactly proportional to traffic density. The statistics are of interest in that they show the proportion of passenger train miles to total train miles. Including mixed and special trains, on the New Haven the proportion is 69 per cent; on the Boston & Maine it is 59 per cent, and on the Albany it is 56 per cent.

The ratio of switch locomotive miles to total locomotive miles shows the relation of switching to road service. For New England, with its many yards, junction points and terminals, the ratio is very high.

We may next examine the very important statistics relating to the train load and the car load.

TRAIN AND CARLOADS (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Passenger train cars per passenger train mile	6.2	5.1	5.0
Percentage of coach or comb. car miles....	42.1	59.1	60.4
Percentage of Pullman car miles.....	26.3	11.0	17.5
Percentage of dining car miles.....	3.0	.6	1.4
Percentage of other pass. train car miles..	28.6	29.3	20.7
Total	100.0	100.0	100.0
Passengers per passenger carrying car mile	19	21	25
Passengers per passenger train mile.....	79	75	97
Freight cars per revenue freight train mile:			
Loaded	20.7	21.6	21.9
Empty (excluding caboose)	9.7	8.2	9.7
Total	30.4	29.8	31.6
Revenue tons per rev. loaded freight car mile	16.0	15.8	15.6
Revenue tons per rev. freight train mile...	330.2	333.5	333.2

In passenger service the Albany has the greatest number of cars per train. The figures reflect the greater proportion of heavy through passenger trains. The New Haven's larger proportion of suburban trains (it has suburban service at both ends of the line, while the Albany has it only at the Boston end) pulls down the average cars per train. On the other hand, the heavy long-distance traffic between Boston and New York gives the New Haven an exceptionally high figure in average passengers per train mile.

In freight car load all of the three roads show practically the same figures, although the Albany has a shade the better of the comparison. This is due partly to its higher proportion of coal tonnage.

Whatever advantage the Albany may have in car load appears to be nullified by other factors, such as heavier grades and a larger percentage of empty car miles. Its trainload is 3.4 tons less than that of the Boston & Maine and 3.1 tons less than that of the New Haven. The small spread between the results on the three roads, considering the differences in traffic characteristics shown by the average receipts per ton mile, is quite remarkable. That each road is making progress in overcoming the handicaps which make the trainload in New England less than in other sections, is shown by the substantial increase in 1915 as compared with 1914. The Albany increased its trainload 24 tons and both the Boston & Maine and New Haven show an increase of 29 tons per train. The car load, however, shows practically no change.

It is of interest to study certain statistics which were at one time regularly compiled by the American Railway Association. The latest complete figures apply to the year ended June 30, 1914. Averaging the semi-monthly reports, the following comparison is made. It applies to a period when the traffic was more normal than in 1915 (a year of lean earnings), or at the present time, when traffic is abnormal and facilities congested.

The first group of figures indicates that both the Albany and the Boston & Maine are car borrowing roads. At that time the New Haven owned more cars than it used, and it was, therefore, a lending road. In 1915, however, the balance of freight car hire went against it, and at the present time, because of the heavy freight traffic and congestion, all

of the three roads are paying heavy debit balances for freight car hire. At the present time the Boston & Maine has over 40,000 cars on its lines daily, and the New Haven something in excess of 50,000. The per cent of cars in the shop at that time indicated an unhealthy condition on the New Haven, a feature which has since been corrected.

UTILIZATION OF FREIGHT CARS
(A. R. A. reports July, 1913-June, 1914)

	B. & A.	B. & M.	N. Y., N. H. & H.
Freight cars owned	7,260	25,445	36,097
Freight cars used daily	7,888	33,642	33,806
Per cent cars used to cars owned	109	132	94
Per cent cars in shops	5.59	6.18	9.09
Average cars on line to one freight loco	43	69	80
Average miles per car day	30.8	18.3	16.1
Average tons per loaded car mile (including non-revenue)	16.1	16.5	16.4
Average tons per total car mile	11.5	12.3	11.7
Average tons per total car day	352	225	188
Average revenue per total car day	\$2.79	\$2.28	\$2.52
Per cent empty car miles	29.0	25.7	28.5

The greatest difference between the three roads appears in "average miles per car day," the performance on the Albany being 91 per cent better than that of the New Haven and 68 per cent better than that of the Boston & Maine. With so much local traffic, with so many terminals and branches, and with such a large proportion of its traffic originating on its lines, the New Haven cannot be expected to get as many miles per car day as can the Albany with its greater proportion of through traffic, its smaller proportion of branch lines, and industrial centers, and its smaller proportion of freight originating on line.

It is exceedingly interesting to note the relation between the average miles per car day and the average earnings per car day. During the period covered by the American Railway Association statistics, the Albany is shown as having the smallest car load, the highest percentage of empty cars, and (in the revenue figures which appear later) the lowest receipts per ton mile. The ton mile receipts of the Albany are less than three-quarters those of the Boston & Maine and but little more than one-half the figures for the New Haven. Yet, by reason of the greater daily use which it gets out of each freight car, it earns more per car day than either the Boston & Maine or the New Haven, with their heavier car load, their smaller percentage of empties, and their greater ton mile revenue.

This brings us naturally to a consideration of train earnings, and average receipts per unit of traffic.

TRAIN MILE REVENUES AND EXPENSES (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Receipts per revenue passenger train mile ..	\$1.771	\$1.572	\$2.051
Receipts per revenue freight train mile	2.689	3.732	4.754
Receipts per revenue total train mile	2.335	2.527	3.029
Operating expenses per total revenue train mile	1.651	1.943	2.044
Net operating revenue per total revenue train mile .....	.684	.584	.985

AVERAGE RECEIPTS PER TRAFFIC UNIT (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Average receipts per passenger (cents)	50.632	35.095	34.553
Average receipts per passenger mile (cents) ..	1.847	1.795	1.828
Average receipts per ton (dollars) .....	.946	1.192	1.308
Average receipts per ton mile (cents) .....	.814	1.119	1.427

AVERAGE DISTANCE CARRIED (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Miles per passenger	27.41	19.55	18.91
Miles per ton	116.20	106.55	91.65

The revenue per train mile is the product of the passenger miles or ton miles per train mile and the average receipts per passenger mile or per ton mile. The net revenue per train mile is what is left after deducting operating expenses. Inasmuch, however, as expenses are not divided so as to show separately the cost per passenger train mile and the cost per freight train mile, the net train mile revenue shown above is of doubtful comparative value. When the division of expenses is made, according to the recent order of the Interstate Commerce Commission, a comparison may then be made of both revenues and expenses separately for the two classes of service. The net revenue per train mile is greater in

freight service. It follows, then, that the average net revenue per train mile is affected quite as much by the proportion which the two classes of service bear to the total as by the net revenue of either or both computed separately.

The New Haven stands first in train mile earnings, both gross and net; the Albany comes next; and the Boston & Maine last. Taking the Boston & Maine as the base, the Albany's net revenue per train mile is 17 per cent more, and that of the New Haven 68 per cent more, than the net revenue per train mile on the Boston & Maine.

The figures pertaining to average receipts and average distance per passenger and per ton reflect the long haul passenger service of the Albany and the short haul freight service of the New Haven. The longer passenger haul on the Albany brings about higher average receipts per passenger mile because of the greater proportion of long distance traffic moved at standard rates, contrasted with the short haul traffic moved at commutation rates. Conversely, the shorter haul per ton on the New Haven brings about high ton mile receipts because of the higher rates per ton mile on local traffic. The length of the haul and the character of the traffic has much to do with the spread between the average revenue units of the Albany and the New Haven. Traffic characteristics, however, have a greater influence. On one hand the Albany has more coal and more export and import freight, moving at low rates, and the New Haven has more merchandise and l. c. l. freight which move at higher rates. The Boston & Maine occupies a middle ground, both with respect to the length of the haul and the ton mile receipts.

Reverting to the passenger mile receipts, it is of interest to note the effect of the suburban traffic. The commissions do not require a separation in the accounts but the Boston & Maine for many years has published the details in its stockholders' annual reports. The figures for 1915 follow:

	Per cent of total		Average receipts per passenger mile
	Passenger trips	Passenger miles	Cents
Season ticket holders	13.5	12.8	0.636
Local passengers	81.6	71.9	1.922
Season tickets and local	95.1	84.7	1.728
Through passengers	4.9	15.3	2.169
All passengers	100.0	100.0	1.795

The tabulation shows that the average receipts per passenger mile on commutation tickets are less than one-third of the receipts per passenger mile on through passengers. Consequently, the volume of suburban traffic has a marked influence toward reducing the general average for all passengers.

We now come to a consideration of operating revenues as a whole.

DIVISION OF OPERATING REVENUES (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
From freight trains, per cent	51.3	57.8	47.7
From passenger trains	42.5	37.5	47.3
From other operating revenues	6.2	4.7	5.0
Total	100.0	100.0	100.0

Reference has been made to the fact that the three roads under discussion are marked by an unusually heavy passenger traffic. For all railroads in the United States, taken as a whole, the freight revenue is nearly 70 per cent of the total. It will be noted that on the New Haven it is only 48 per cent; on the Albany 50 per cent and on the Boston & Maine 59 per cent.

Until a satisfactory basis for dividing operating expenses has been formulated and tried out in practice, it is impossible to state in exact terms the relative remunerativeness of the passenger and freight services taken separately. There can be little doubt that the passenger service is the least profitable, particularly when we consider the large investments in passenger terminals and passenger train equipment. This condition should be given full weight in comparing the operating results of New England roads with those of other rail-

roads which enjoy the greater profits of a greater proportion of freight traffic. As between the three roads under comparison we are next concerned with operating expenses.

DIVISION OF OPERATING EXPENSES (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Maint. of way and structures, per cent....	16.8	20.0	17.5
Maintenance of equipment.....	17.3	18.6	22.1
Traffic expenses	2.0	1.2	1.1
Transportation expenses	57.7	56.2	54.4
Incidental expenses	2.8	.8	1.3
General expenses	3.4	3.2	3.6
Total operating expenses	100.0	100.0	100.0

During the fiscal year 1915 the Albany and the New Haven expended less than the normal amount on maintenance of way and structures and the Boston & Maine somewhat more than usual on account of starting its track work earlier in 1915 than in previous years. In maintenance of equipment, the New Haven shows heavy charges due to extensive freight car work. In each case, the ratio of transportation expenses, influenced in part by the heavier train load, is relatively less than in 1914.

It is not practicable to derive many unit costs from the details of expenses. For such costs, the statistician must have access to supplementary data compiled for railroad use only and not shown separately in public documents. We may, however, compute some averages which will assist us in the comparative study.

UNIT COSTS OF OPERATION (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
*Section forces per equivalent track mile....	\$724	\$629	\$587
*Total M. of W. & S. exp. per equivalent track mile	2,280	2,080	2,144
Total M. of W. & S. exp. per road mile....	4,996	3,126	3,858
Repair cost per locomotive	2,096	1,962	2,025
Repair cost per passenger car.....	668	289	262
Repair cost per freight car.....	44	104	85
Repair cost per rev. loco. mile (cents).....	7.86	8.51	9.08
Repair cost per rev. pass. car mile (cents)...	1.68	1.10	1.42
Repair cost per rev. freight car mile (cents)...	.37	1.12	1.42
Station and yard expenses per revenue train mile (cents)	30.0	40.9	37.5
Train expenses per rev. train mile (cents)...	54.8	54.5	51.7
†Casualty expenses per rev. train mile (cts.)	4.7	5.3	6.5

* Section forces expense includes charges to "roadway maintenance" and "track laying and surfacing." Equivalent track miles on basis of: 1st main track equals 1.0; multiple running tracks equals .8; yards and siding equals .5.

† Includes cost of clearing wrecks, injuries to persons, loss and damage to freight, baggage and property, and stock claims.

Attention is called to the basis used in comparing maintenance of way expenses, viz.: the equated track mile which considers one mile of additional running track as 0.8 of a mile of first running track, and a mile of yards and sidings as 0.5 of a mile of first running track. A comparison is made also of all maintenance of way expenses on a road mile basis. It is hardly satisfactory to narrow the comparison to one year. A five year comparison would give a fairer indication.

The average maintenance costs per locomotive and per passenger car are fairly comparable, but the freight car figure is misleading without the explanation that it is derived by dividing the total freight car repairs by the total freight cars owned. Obviously the average is incorrect unless the number of cars owned is approximately equal to the number of cars used. An average which is fairer is given in repair cost per freight car mile. The very low figure on the Albany indicates that heavy freight car work apparently was suspended temporarily, or was unnecessary on new cars. The relatively high cost on the New Haven is due to an extensive program of freight car rehabilitation. In a smaller measure the same explanation applies to the Boston & Maine.

One distinguishing characteristic of New England railroads,—the dense passenger traffic,—has already been alluded to. Another is its relatively large proportion of yards, junction points and terminals. It has become trite to say that New England is one large yard. But the effect is seen in the relatively heavy cost of station and yard operation. The cost on the Boston & Maine (40.9 cents per train mile) is nearly 50 per cent greater than the average for the United

States; the New Haven cost is only slightly less than that of the Boston & Maine. The Albany is not far above the average for the country, but it is not handicapped to the same extent as the Boston & Maine and New Haven.

The cost of train expenses does not show much variation. The New Haven is lowest, as would be expected with its greater percentage of passenger train miles. New England railroads are handicapped in comparison with other eastern railroads by the relatively high cost of coal.

For every mile of road operated, the Albany has operating revenues of \$42,118; the New Haven, \$32,638; and the Boston & Maine, \$20,276. After deducting expenses, which are 67.49 per cent on the New Haven; 70.72 per cent on the Albany; and 76.94 per cent on the Boston & Maine, the net operating revenue stands \$12,334 for the Albany; \$10,610 for the New Haven; and \$4,676 for the Boston & Maine.

The percentage of taxes to operating revenues is about the same on the three roads, leaving the operating income \$10,498 for the Albany; \$9,237 for the New Haven; and \$3,814 for the Boston & Maine.

INCOME ACCOUNT PER MILE OF ROAD (1915)

	B. & A.	B. & M.	N. Y., N. H. & H.
Operating revenues	\$42,118	\$20,276	\$32,638
Operating expenses	29,784	15,600	22,028
Net operating revenues	12,334	4,676	10,610
Operating ratio, per cent.....	70.72	76.94	67.49
Taxes	\$1,833	\$859	\$1,369
Ratio of taxes to operating revenues, per cent	4.36	4.24	4.20
Uncollectible revenue	\$3	\$3	\$4
Railway operating income	10,498	3,814	9,237
Non-operating income	899	523	2,924
Gross income	11,397	4,337	12,161
Rental leased lines	243	2,428	3,110
Hire of freight cars.....	1,835	521	130
Hire of other equipment.....	1,414	133	169
Interest on funded debt.....	2,635	762	4,683
Interest on unfunded debt	1	552	899
Other deductions	514	86	2,018
Total deductions	6,642	4,482	11,009
Net corporate income	4,755	145*	1,152
Per cent net corporate income to capital stock	7.47†	0.8*	1.31

* Deficit.

† N. Y. C. & R. R. guarantees 8 per cent. The deficit under lease amounted to \$360 per mile of road.

On account of cross-entries between non-operating income and deductions from income, the figures shown in detail under deductions are not strictly comparable. The income from investments in affiliated companies or outside properties appears in non-operating income, and the interest charges on the securities issued against these investments appear in "interest on funded debt" or "interest on unfunded debt." In looking at the New Haven's high interest charges consideration must be given at the same time to its high non-operating income. Subtracting such income from the total deductions, the net deduction from the New Haven's operating income is \$8,085. For the Albany, the net figure is \$5,743; and for the Boston & Maine \$3,959.

The final figure for net corporate income per mile for the Albany is \$4,754; for the New Haven \$1,152; and for the Boston & Maine there is a deficit of \$145.

The net corporate income on the Albany represents 7.47 per cent on its capital stock. Since the lessee road, the New York Central, guarantees 8 per cent to Albany stockholders, there is a deficit of \$141,000, or approximately \$360 per mile, which the New York Central must make up.

For the New Haven, the net corporate income is equivalent to 1.31 per cent on the capital stock; and for the Boston & Maine the excess of fixed charges over income is equal to a loss of 0.8 per cent on the capital stock.

It is a matter of common knowledge that the net results during the current fiscal year, on account of the abnormal freight traffic, will be much more satisfactory. The Albany will have no difficulty in earning the New York Central's guarantee of 8 per cent on the capital stock; and both the New Haven and the Boston & Maine will show substantial increases over 1915 in net corporate income.

Discussion. The paper was discussed by Professor C. F.

Allen, of the Massachusetts Institute of Technology, who expressed the opinion that one of the reasons for the Albany's good showing in comparison with the other two roads was partly explained by the fact that the Albany had been "sick" first and had had the longest time to recover. J. A. Droege, general superintendent of the New Haven, noted that the importance of the New Haven as a passenger road is shown by the fact that one in every 11 or 12 passengers carried in the United States rides on the New Haven. C. Peter Clark, of the Bureau of Schedules and Rates of the Massachusetts Public Service Commission, and formerly an officer of the New Haven, commenting on the signaling statistics, said that he was one of those who brought from England the first interlocking plant introduced in New England. This was a 32 lever plant. It was put in service at Walpole, Mass., and was the first interlocking plant, he said, recognized in this country by railroad commissions as a satisfactory interlocking permitting the elimination of the "blind-stop." Professor Cunningham, in closing the discussion, said, in answer to a question, that no figures had been made public concerning the main line doing the densest passenger business. He believed that the Pennsylvania Railroad between Manhattan Transfer and Philadelphia probably came first, the New Haven between New York and New Haven second, and the Boston & Albany between Boston and Albany third.

HANDLING FREIGHT EMBARGOES

Within the last five months railroads operating in eastern territory, and especially those having seaboard termini, have been compelled to employ embargoes extensively to prevent such accumulations of various classes of freight traffic as would have resulted ultimately in complete blockades in certain districts. These embargoes are based upon the provisions of Per Diem rule 15 of the American Railway Association, which reads:

"When a road gives notice to a connection that for any reason it cannot accept cars in any specified traffic, thereby instituting an embargo, it should receive cars already loaded with such traffic on the date such notice is issued, and cars loaded within 24 hours thereafter. If it does not receive such cars the road holding them may reclaim Per Diem under rule 14. from the road placing the embargo for the number of days such cars are held not exceeding the duration of the embargo.

"Twenty-four hours after the date of the notice a road must not load or reconsign cars in such traffic to the road issuing the notice.

"Embargo notices must be sent by the embargoing road to its direct connection. They must be sent to a designated officer by wire, with reference number, and confirmed by letter the same date. They must give the reason why the embargo is placed, and state whether cars in transit will be accepted.

"No embargo will be placed on empty cars returning home in accordance with the car service rules."

This rule was promulgated and adopted to serve as an emergency measure *only*; and as a general proposition it seems to have met the requirements in that direction quite fully. Its value in connection with the particular situation now prevailing cannot be measured; and, while criticisms pertaining to the rule have been made from time to time, it is believed that the majority of these criticisms may be traced to the knowledge of results which were not contemplated by the rule and which were the outgrowth of improper practices indulged in to some extent by both the interested carriers and shippers.

An embargo, to serve satisfactorily the purpose for which it is intended, must be sufficiently clear and explicit from the standpoint of context to insure uniform application, and must be transmitted by telegraph or telephone to the end that

distribution of the information embraced by the embargo among all concerned may be accomplished as promptly as practicable after the emergency responsible for its issuance has developed.

The roads have endeavored to conform their practices in the handling of embargoes to these two principles, but certain exceptions have been imperative on account of over-taxed telegraph and telephone facilities; the very great diversity of traffic, necessitating lengthy embargoes and modifications thereof; the large area covered by the embargoes and modifications thereof, and frequent changes in the situation in the East. These exceptions have contributed largely, at least, to the development of sentiment unfavorable to the plan outlined in Per Diem rule 15.

An embargo, *when effective, prohibits absolutely* the movement of traffic involved by it to an embargoing road; but thousands of shipments within the last five months have been forwarded from points of origin contrary to existing embargoes and that practice has also contributed in no small measure to the development of sentiment unfavorable to the authorized plan.

The responsibility for the practice, which has been accompanied by enormous expenses to carriers without material benefits of a permanent nature to either the carriers or the public, including interested shippers and receivers of traffic, is a divided one. The forwarding of traffic in some cases in violation of embargoes or contrary to the intent of modifications of embargoes has unquestionably resulted from sincere misinterpretations of the information at hand by representatives of the carriers and by shippers, while in other cases violations have been the result entirely of sharp practices.

Unintelligible embargoes or modifications of embargoes have constituted a common excuse for the forwarding of traffic which should not have been forwarded, by those who may be inclined to resort to sharp practices for personal advantages, regardless of how far-reaching the adverse effects of such practices may be in their relation to the interests of a large percentage of the public and the carriers affected. The removal of the basis for this common excuse is one of the objects sought by the Pennsylvania Lines through the recent adoption of more detailed regulations.

The plan to which the regulations referred to apply contemplates uniformity of practice in the issuance and handling otherwise of embargoes and of their modifications, and cancellations of embargoes with respect to form (context and general arrangement); a system of numbering; the means of transmission, and systems of distribution and of filing. The Pennsylvania Lines have also considered the possibilities of wireless telegraph in connection with the expeditious dissemination of embargoes (including modifications and cancellations thereof) among various interested representatives of the system.

The instructions of the Pennsylvania Lines include 27 different items and give employees and shippers complete information regarding the embargoes in force and the method of applying them. For instance, the agents are advised that they may accept all freight loaded or in process of loading if billed up to midnight of the date following the date of issue of the embargo, while with freight in process of loading and not billed within this 24-hr. limit, the agent is instructed to report the facts to the superintendent for instruction. Similarly others of the more common causes of misunderstandings are explained in considerable detail so that the employees may know what to do in each case and may be able to follow the rules completely and intelligently. In this way, the forwarding of freight contrary to embargoes can be eliminated and confusion avoided.

We are indebted to J. W. Roberts, superintendent of freight transportation Pennsylvania Lines, for information concerning these practices which have been put into effect on this road.

RICHARD H. AISHTON

The election of Richard H. Aishton as president of the Chicago & North Western Railway, which was announced in the *Railway Age Gazette* of May 26, was the logical advancement of one whose career has been one of steady progress and achievement on this road since he entered its service as an axman in its engineering department 38 years ago. As this statement implies, his entire railway life, which he began when only 18 years old, has been spent on the railway of which he is now president.

It is not uncommon for railway presidents to rise from the ranks. In fact, they usually do. It is very uncommon, however, for a boy to enter the service of a road at 18 and stay in it continuously until he advances to the presidency, as has been the case with Mr. Aishton. When this occurs it can seldom be due to anything except hard work and great ability; and it is to them that it is due in his case. Mr. Aishton has the qualities which enable a man to be a forceful and even exacting executive, and at the same time to make himself unusually popular. His long service and consequent wide acquaintanceship among both the patrons and the employees of the North Western, and his very democratic ways and personal popularity caused the news of his election to give pleasure to the people generally along the road, and especially to its employees and officers of all ranks.

While his entire service has been on the North Western his activities have not been confined to its affairs. He has devoted himself with characteristic energy to things in which both the railways of the granger group to which the North Western belongs, and the railways of the country as a whole, are interested. He was a member of the first conference committee of managers appointed by the western group of railways to deal with a concerted wage movement on the part of certain of their employees in train service. He was for some time chairman of the General Managers' Association of Chicago.

He has been a leader in the American Railway Association; has served on different committees, including the executive committee; was first vice-president for two years, until last month; and it is violating no confidence to say that he would have been advanced to the presidency had he not declined. He also served for some years as a member of the Committee on the Relations of Railway Operation to Legislation. His civic activities have been numerous. He has long been active in the affairs of the Chicago Association of Commerce, and is now a member of its executive committee. When F. A. Delano retired from the National Commission on Industrial Relations, which recently went out of existence, Mr. Aishton was appointed by President Wilson to succeed him, and participated in the investigations of that body and in the preparation of its report.

The foregoing very general and inadequate statement of facts regarding Mr. Aishton's career and his varied activities

is sufficient to classify him decisively among "modern" railway executives. In past years, and especially before effective regulation was adopted, the problem of railway managers was almost solely that of developing and operating their individual lines efficiently. The course of events in later years has made it necessary for railway executive officers to deal with the public on different terms and to co-operate more closely with those of other roads. The test of their capacity has become not only the ability they show directly in serving their own companies, but also that which they show in dealing with the public and in helping to bring about co-operation between the various railways. Mr. Aishton has taken his place among the leaders of the modern school of railway officers, because he has been highly successful in meeting this test. He enters upon the duties of president with a broad experience and an admirable equipment gained, not only in the operation of the property, but also in dealing with the large problems presented by the relations between the railways and the public, between the railways and their employees, and between the railways themselves.

All of his railway career has been in the operating department. He first spent 17 years in the engineering branch of this department, and although not technically educated, rose to the rank of division engineer, and handled much important engineering work. The construction of the second track on the Iowa division, from Clinton to Omaha, which was intrusted to him, was one of the most important pieces of work ever handled in the engineering department of the road.

His promotion from division engineer to assistant superintendent gave him the opportunity to begin to acquire his broad knowledge of transportation matters in general. Most of his service, until he was transferred to Chicago as general superintendent, was on the com-

pany's lines in Iowa, and no railway man is better known or has more friends there. He has participated in effecting so many improvements in railway operation and service that it would be necessary to go into much detail to mention them all. He was vice-president in charge of operation when the "safety first" movement was inaugurated on the North Western. He devoted himself energetically to promoting it, and the good relations which already existed between the operating officers and the employees contributed greatly towards its success. Recently he has taken active and effective interest in solving the problem of increasing the average load per freight car; and the methods which have been adopted under his direction have attracted much attention on other roads.

Mr. Aishton is personally forceful and alert but at the same time genial and readily accessible. He is a strenuous worker, his only recreation being gardening at his attractive home in Evanston and playing golf. He is very loyal to those immediately associated with him and they are just as loyal to him—a fact well illustrated by the circumstance that M. J. Gormley, who has been his chief clerk as vice-president and who now becomes his chief clerk as president, has



Richard H. Aishton

been with him as secretary and chief clerk ever since the days when he was superintendent of the Iowa division.

Richard Henry Aishton was born in Evanston, Ill., at his present home, on June 2, 1860, and was educated in the public schools of that place. He entered the service of the North Western in 1878 as an axman in the engineering corps, and served consecutively as rodman, levelman, assistant engineer, superintendent of bridges and buildings and division engineer. From June, 1895, to April, 1897, he was assistant superintendent, and then to November 1, 1899, division superintendent. He was general superintendent to July, 1902, and assistant general manager to January, 1906, when he was appointed general manager. He was appointed vice-president in charge of operation and maintenance in November, 1910.

RAIL MANUFACTURE*

By J. S. Unger

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The amount of money expended annually for steel rails in the United States during the past five years has averaged over \$80,000,000. The rail industry ranks third in tonnage among the steel products and constitutes about 12 per cent of all the steel rolled into finished material.

Owing to the severe demands made of the rail, a great deal of time has been given to investigating it by both the producer and the user. The rail manufacturers have been engaged for years in making studies and investigations looking towards rail improvement, beginning with the manufacture of the steel and extending through all the subsequent operations to the finished rail. In addition, they have thrown their works open to a representative engineer of a prominent railroad society, who has made many investigations at almost every rail mill in the country. Such co-operative work must result in a better knowledge of factors entering into rail manufacture. To be of the greatest service, such information must be supplemented by studies of the use and maintenance of the rail in actual service.

In studying the rail problem, one is impressed with the great number of rail sections. Standards have been prepared and adopted by engineering societies, but they are used by few railroads, the larger railway systems having their own sections. In the same weight of rail, one finds the extremes from a thin, flat head with a deep web and thin flange, to a round head, with a short web and thick flange.

In spite of the futile efforts of societies to decrease the number of sections, they have grown. Take a standard weight, say 85 lb. If a number of sections of this weight give equally good results, the natural conclusions are that all are good and that differences in section are unimportant, or that all are bad and the best has not been discovered. A decided economy could be effected by having few sections, as the cost of rolls and changes necessary to produce different sections is an important one.

Another important consideration in the manufacture of rails is the large number of specifications. As a whole, there is very little difference among them, except that some carry more restrictions than others. Is it not possible for the railroads to harmonize their specifications for rails? This should result in a common specification to cover all rails. If this could be done, it would be one step in the right direction.

The primary considerations with rails are safety, durability and cost. The severity of modern railroad service requires that every effort be made to insure safety and to produce more

durable rails. Heavier rails are necessary to meet these severe conditions. The heavier rail is an improvement when it is not merely an added weight of 5 to 10 lb. per yard, but a pronounced increase in size. Weight in rails, except as it affects costs, is not objectionable, as it is not a moving load.

The impression is that heavy rails lack ductility, but this is true in a comparative sense only. A heavy rail cannot be bent to the same extent as a light rail. A re-rolled 30-lb. rail will stand more bending than the 100-lb. rail from which it has been rolled, even though the finishing temperatures were the same. This is to be expected, as a similar condition exists when any article of steel is compared with one of heavier section made from the same steel. A piece of wire can be bent more than a 3-in. axle, although both are of the same steel.

There is a growing tendency at the present time on some railroads to install heavier rails. One railroad has 135-lb. rails in service on its fast passenger tracks, and another system has recently placed a large order for 130-lb. rails. Some of the very heavy rail sections have not proven to be as satisfactory as was expected at the beginning of their use, but later experiments with some modifications in section have given satisfactory results. It would be idle to predict where the weight in rails may end, but a 200-lb. rail is a future probability.

A new rail mill at the Edgar Thomson works at Bessemer, Pa., was completed early in the present year, which is capable of rolling rails up to 150-lb. per yard, and will be able to supply any demand for heavier rails for some time to come. In looking towards possible rail betterment, this plant is using an ingot 25½ in. square, instead of the smaller ingot used by many of the older mills. The ingot is bloomed at the beginning in a tandem, two-high, non-reversing 48-in. mill with two passes in each stand. The ingot first goes through a pass in the first stand, then is turned 90 deg. and given a pass in the second stand. It is then returned to the first stand by a turntable and carrier, again turned 90 deg. given another pass, turned again and given a last pass in the second stand, thus rolling the ingot on all sides, turning at every pass before being sent to the three-high 40-in. reversing blooming mill, which completes the blooming. The bloom is then sheared, reheated and rolled on the rail mill.

The advantages of the preliminary blooming lie in the large fillets used in the rolls, avoiding any tearing at the corners of the ingot, the very slow rolling speed employed giving a kneading action to the plastic surface of the ingot, and the rolling on all sides working all surfaces of the metal equally. This mill has been rolling rails of 130-lb. for almost a month. To give some idea of the quality of these heavy rails, not a single one has failed in any of the mechanical tests made at this works to date.

Numerous other features of this mill are particularly noteworthy, among them being commodious underground passages to the mill machinery and to the soaking pits. This permits making changes in the mill equipment readily when such are necessary.

The investigations of the rail manufacture have not only covered the manufacture of rails, but also some of the causes of rail failures. I do not believe a rail testing machine can be built which will exactly imitate service conditions. The vibration and loading may be duplicated, but to imitate the speed at which they are applied would be difficult if not impossible.

In studying rail failures, a study should be made of some of the causes which may assist in producing them. Bad gaging of track, worn wheel tread and flanges, flat spots on wheels, poor trucks, poor sub-grade, insufficient balast, improper counterbalance on engines, bad ties and insufficient area of contact between the wheel and the rail should be considered. Rail maintenance and the condition of rolling stock

*Presented before the tenth general meeting of the American Iron and Steel Institute, New York, on May 26.

exercise an important influence. Rails rarely break on trestles, crane runways or bridges. When failures occur at these points, they are due to crushing or split heads, which are noticeable and can be removed before an accident occurs.

In an accident, a broken rail may show better quality than the adjoining or opposite rails which did not break, but it failed. The question might be asked, when is a rail a good rail? Rail failures are few when compared with the number of rails used annually, and would not be considered serious in most of the ordinary articles made of steel. As rail breakage of such consequence that it cannot be disregarded, can the rail not be made strong enough or so supported that it will not break?

Rail failures are greatly dependent on climate and locality. A railroad office of a road in the northwest claimed he could examine his monthly record of broken wheels and rails and determine the date and at what point on the road they had extremely cold weather. This statement is borne out in drop testing rails at temperatures from 50 to 100 deg. below zero, Fahrenheit, which showed a pronounced falling off in resistance to shock. In these tests, the added effects of a frozen road bed could not be studied.

Transverse fissures appear as a new rail disease. Apparently composition is not responsible for their occurrence, as they are found in both segregated and unsegregated rails and from every part of the ingot. Lack of ductility of the steel cannot be charged against it, as of 102 rails removed for transverse fissures, more than one-half had an elongation of over 10 per cent, while one of the rails giving only 7 months' service had 14 per cent elongation.

From incomplete investigations made, transverse fissures appear to be a kind of detailed fracture, the result of a combination of cold rolling or working of the metal in service and vibration of the rail. The results so far indicate they may be produced on a new or worn rail at any point desired. If this can be proven, the answer is obvious. A rail must be so strong or so well supported that it cannot vibrate. I have made many inquiries, but have not heard of a case of a transverse fissure on a well supported rail, as on a bridge. Some engineers go so far as to recommend that a rail be laid on a longitudinal girder to support it.

The service demanded of the rail by the modern railroad is necessarily severe. Safety must be the primary consideration.

Rail durability can be obtained by several methods. Alloy steels, of which manganese steel is a good example, is one method, but its cost, except for special locations, as at yards, switches, terminals, or congested traffic points, is prohibitive. Heat-treated rails of alloy or carbon steels have shown less wear in the few service tests made to date, and are another example of possible improvement in rail durability. Rail improvement will be made. This result will probably be reached by using the best steel obtainable, increasing the size of section and giving the best possible maintenance. A combination of these factors should lead to a settlement of the rail question.

JAMES T. CLARK

The recent election of James T. Clark to the presidency of the Chicago, St. Paul, Minneapolis & Omaha Railway, adds another to the long list of railroad presidents who have risen from the ranks to high railway positions. From the time that he entered railway service as a messenger boy 46 years ago, Mr. Clark has devoted himself assiduously and energetically to his chosen business. Good-tempered and of sound judgment, he has won the friendship and respect of all who know him. His sympathetic appreciation of the problems and trials of his subordinates has made his relations with them closer than is ordinarily true of business ties. His life has not been spectacular, but is typical of the success that rewards whole-souled devotion to a single end. A leader in athletic sports in his youth, he is now a lover of golf, which is his principal recreation.

Recently, Mr. Clark has been prominent in the movement for a union depot at St. Paul. As the representative of the North Western interests in the negotiations preceding the acceptance of the first station site, later rejected by the government, he did much to harmonize the many conflicting interests of the roads involved and to bring about a general agreement upon a single plan.

His experience has been largely in the traffic department, first in positions of minor importance and finally as vice-president in charge of traffic.

Mr. Clark was born at Auburn, N. Y., on November 20, 1852, and entered railway service in 1870, as a messenger boy in the office of the general agent of the Illinois Central at St. Louis, Mo. In July, 1873, he entered the employ of the Chicago & North Western, as a clerk in the general passenger department. Later, he held clerical positions in the offices of the general

superintendent and the general manager, and in April, 1880, was appointed general agent at Omaha, Neb., and Council Bluffs, Iowa.

From January 15, to November, 1883, he was assistant traffic manager of the Chicago, St. Paul, Minneapolis & Omaha, and from the latter date until December, 1884, was assistant general freight agent of the same railroad. For twelve years he held the position of general freight agent, being promoted to general traffic manager on October 1, 1896. From June 5, 1899, up to the time of his recent election to the presidency, he was vice-president in charge of traffic and since March 9, 1909, has also been vice-president in charge of operation and construction. As president of the Omaha, he will continue to have headquarters at St. Paul, Minn.

ITALIAN NORTH AFRICA.—The second section of the Bengazi-Derne Railway in Cirenaica has recently been opened. It runs from Lete Benina to Regima, is about 12 miles long, and, with the trackage formerly completed between Bengazi and Lete Benina, gives a total of 25 miles of railroad in the province.



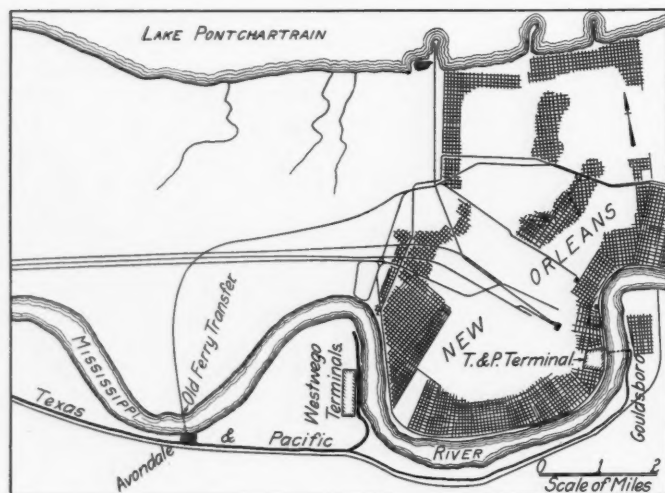
James T. Clark



Concourse Looking Towards the Thalia Street Entrance

THE new passenger station and freight terminals of the Trans-Mississippi Terminal Company were recently opened for traffic at New Orleans, thereby affording new terminal facilities in that city for the Texas & Pacific and the St. Louis, Iron Mountain & Southern, joint owners of the terminal corporation. This terminal property and the new buildings which form a part of it represent an outlay of over \$4,000,000.

The Texas & Pacific has a line on the south side of the Mississippi river opposite New Orleans with terminals and wharves at Westwego and Gouldsboro. Passenger trains formerly crossed the river by ferry at Avondale, ten miles up the river from the new terminal, and entered the city over the tracks and terminals of another railroad. Under the new arrangement the terminal company has taken over the facilities at Westwego and Gouldsboro and a new passenger terminal and local freight station have been provided in New Orleans near the river front opposite Gouldsboro. The

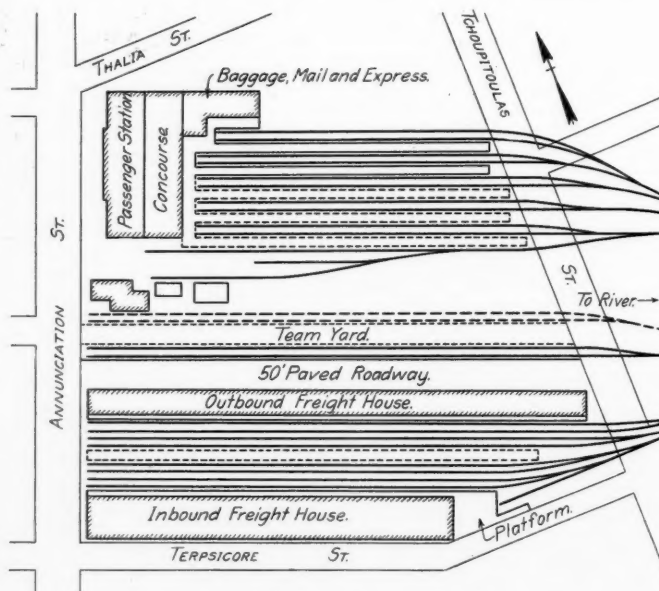


Map of New Orleans and Vicinity

Texas & Pacific thus reaches a terminal near the heart of New Orleans, entirely over its own rails except for the ferry transfer at Gouldsboro, while the Iron Mountain now uses the same facilities for freight traffic by trackage rights on the Texas & Pacific from Alexandria, La.

CENTRAL LOCATION FOR NEW FACILITIES

The new facilities are located between Thalia and Terpsichore streets, and extend from the ferry connection at the river bank to Annunciation street, an important thoroughfare, on which the passenger station faces. The acquisition of this site involved the purchase of a large area of valuable property, and an agreement with the city which required



Layout of the Terminal

the repaving of the bordering and crossing streets, the widening of Annunciation street, and provision for a bordering street along the river between Thalia and Terpsichore streets.

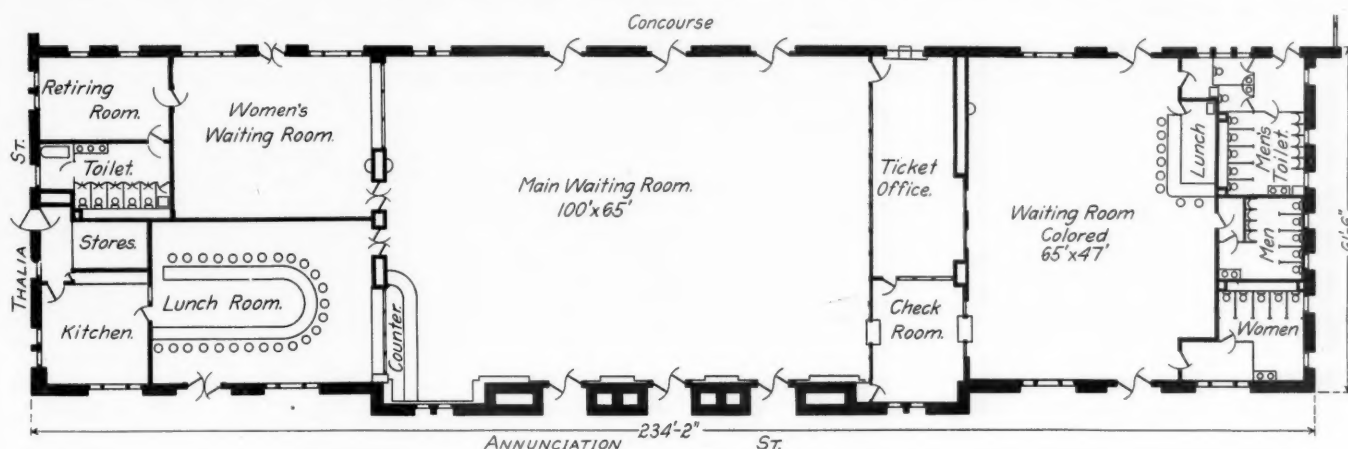
As seen in the accompanying map the layout is convenient and simple. It includes a passenger station located at the corner of Annunciation and Thalia streets, with frontage on each, to be served ultimately by 11 tracks having a total clear length of 6,000 ft. There is also a team yard with an ultimate development of four tracks, aggregating 3,200 ft. and inbound and outbound freight houses served by eight tracks, with a total length of 6,100 ft. These tracks are divided into two groups, of four each, separated by

a space for a 14-ft. transfer platform to be built later. The inbound house has street frontage for its entire length while the outbound house is served by a 50-ft. paved roadway, continuous from Annunciation street to Tchoupitoulas street.

THE PASSENGER STATION

The passenger station has an unusually simple arrangement. The station building is 62 ft. by 236 ft., fronting on Annunciation street. Between this and the tracks is a concourse of practically the same dimensions, with its north

The main waiting room is treated with light gray marble floors, English vein Italian marble wainscot 10 ft. high, with ornamental plaster above that level. Similar treatment is given the other portions of the building. There are three main entrances from Annunciation street into the main waiting room and corresponding doors from the same to the concourse. There are also street doors into the lunch room and the colored waiting room. An awning is provided over the three main entrances and a broad marquis over the Thalia street entrance to the concourse. The latter serves as a porte



Plan of the Passenger Station

end fronting on Thalia street. The baggage and express building is located north of the tracks and east of and adjacent to the concourse, and also has frontage on Thalia street.

The architectural design of the building is attractive. The central portion, elevated above the wings, accentuates the location and importance of the main waiting room. The treatment is the modified classic, carried out with a granite base, rough stone dado and tooled lime stone facing. The

cochere, as all vehicles come to that point to deposit passengers or receive them from the trains.

The tracks are arranged in pairs 13 ft. center to center with platforms 16 ft. wide. The track platforms will accommodate only about 6 cars each. This is adequate because of the operating arrangement adopted by reason of the ferry transfer. The passenger trains are run between the new station and the ferry in sections of three cars each, as they are divided to go on the boat. Similarly inbound passenger



The Passenger Station from Annunciation Street

main waiting room, 100 ft. long by 65 ft. wide, occupies the full height and practically the full width of the central section of the building. The west wing contains the waiting room and facilities for colored passengers, and the east wing contains a lunch room and a waiting room and toilet rooms for women. The ticket offices and check room are located in the central part of the building between the main waiting room and the colored waiting room, serving both.

trains are divided into sections at Gouldsboro just before making the transfer. This saves the time and inconvenience of recoupling trains after crossing the river and permits the placing of the baggage, mail and express cars on the track next to the baggage room without additional switching, thereby reducing trucking operations and reducing the interference with the passengers.

The platforms are covered with butterfly sheds having steel

frames and concrete roofs. These sheds connect with the overhanging roof of the concourse, which is also of concrete supported on steel trusses. The concourse is separated from the tracks by an iron railing provided with five gates.

THE FREIGHT FACILITIES

The inbound freight house is a building 70 ft. wide by 593 ft. 6 in. long. For a distance of 213 ft. 6 in. south from Annunciation street it is a two-story reinforced concrete building with brick curtain walls, the concrete columns being spaced 20 ft. apart longitudinally and 17 ft. 1½ in. transversely. The remaining 380 ft. of the building is one story high with brick walls and steel roof trusses, supported on columns built into the brick work. The longitudinal panel spacing of 20 ft. is maintained in this portion of the building but the roof trusses give a clear span from wall to wall. All of the first floor of the freight house with the exception of the first two panels in the two-story portion is devoted to freight house purposes. The first two bays are used for office purposes and records and the second floor is used for freight offices and division operating headquarters. The



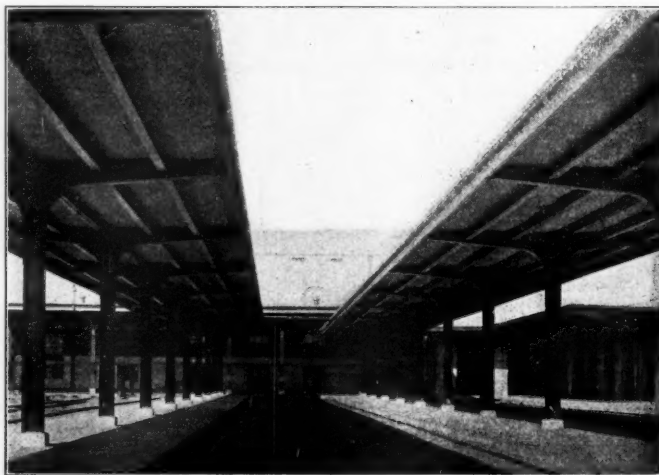
A Corner in the Main Waiting Room

second floor is designed to permit its use for storing freight in case this should prove desirable or necessary.

A 12-ft. canopy supported on steel trusses continuous with those inside the building is provided for the entire length of the house on the team side. An 8-ft. trucking platform is provided on the track side, also covered with a canopy. Doors 8 ft. by 8 ft., equipped with 22-gage steel Kinnear rolling doors, are provided on each side of the house in the center of each 20-ft. bay. Artificial illumination is afforded by three 60-watt lamps per bay in the house and one in each alternate bay on the platform. These lamps are grouped in small circuits so that small sections of the house may be controlled independently. Receptacles for extension lights to take into the cars are provided along the track side.

The house is supported on column pedestals carried on pile foundations. An unusual feature in this connection was the reinforcing of these pedestals with old street car rails of the girder type. Pedestals under the one-story portion were proportioned for a distance of 100 ft. beyond the end of the

two-story portion with a view to the future extension of the two-story building. The floor of the entire house and the trucking platform is of concrete reinforced with wire mesh, and supported on an earth fill, which is retained on either side of the house by concrete curtain walls. To get a 4-ft. height of the floor adjacent to the track and a 3-ft. height on the team side, the floor has a pitch of 9 in. across the house. A grade of 0.3 per cent is provided also in the length of the house to conform to the natural ground slope. Another



Trainsheds Looking Toward the Station

unique feature is the use of granite blocks 12 in. by 14 in. in section and 20 to 24 in. long, set on edge in the pavement in front of each team way door to serve as a wheel guard in place of the usual timber bumper.

The roof of the one-story portion is a 3-in. concrete slab supported on I-beam purlins encased in concrete. This roof slab is reinforced with American wire fabric and covered with a tar and gravel roof. The same character of roof is used on the two-story part in conjunction with the reinforced concrete construction of that portion, which is of the beam and girder type. As a protection against heat the second story



One-Story Portion of the Inbound Freight House

is provided with a metal lath and plaster ceiling suspended from the concrete roof framing.

The outbound house is 40 ft. by 818 ft. one story throughout and is identical in construction with the one-story portion of the inbound freight house. Scales with 7 ft. by 9 ft. platforms were installed in both houses, 6 in the inbound house and 18 in the outbound house. In the former they are located next to the wall on the track side and in the latter 6 ft. from the wall on the team side. Another feature of the

facilities is a concrete platform, located at the south end of the inbound house, to be used for unloading automobiles or other heavy articles. It is provided with an incline for easy access to the street level.

The paving of city streets demanded by the city in connection with this work and that required on the railroad property involved considerable expense. It included in all about 27,000 sq. yd. of granite blocks and 15,000 sq. yd. of creosoted wood blocks. On several of the streets repaved, large granite blocks from 12 to 14 in. square and 18 to 24 in. long were taken up. These were cut by hand on the ground into blocks 6 in. by 8 in. by 7 in., thus providing a sufficient number of blocks to do all the necessary paving about the freight houses.

This project has been carried out under the general direction of J. L. Lancaster, formerly assistant to first vice-president and recently appointed vice-president of the Texas & Pacific and vice-president of the Trans-Mississippi Terminal Company, and C. H. Chamberlin, chief engineer of the Texas & Pacific. A. F. Barclay, resident engineer, was in direct charge of the construction and the design of the track layout and freight terminals. Favrot & Livandais, New Orleans, were the architects for the passenger station, and J. W. Thompson, St. Louis, was the contractor.

TRAIN ACCIDENTS IN MARCH¹

The following is a list of the most notable train accidents that occurred on railways of the United States in the month of March, 1916:

Collisions					
Date.	Road.	Place.	Kind of Accident.	Kind of Train.	Kil'd. Inj'd.
†3.	N. Y. C.	Albany	rc	F. & F.	3 1
†4.	Chi. St. P. M. & O.	Mountain Lake	rc	F. & F.	3 5
16.	Del. & Hudson	Schoharie J.	rc	F. & F.	0 15
*22.	Minn. & St. L.	New Richland	rc	F. & F.	4 1
25.	Southern	Powder Springs	bc	F. & F.	0 9
25.	C. New England	Canaan	rc	F. & F.	1 0
29.	Union Pacific	Menoken	bc	F. & F.	0 12
†29.	New York Central	Amherst, O.	rc	P. & F.	26 40

Derailments					
Date.	Road.	Place.	Cause of Derailment.	Kind of Train.	Kil'd. Inj'd.
†1.	Denver & R. G.	Sapinero	slide	P.	2 0
3.	Louisville & N.	Henderson	acc. obst.	P.	1 0
†4.	S. Dakota C.	Watertown	burnt bridge	P.	2 13
8.	Pennsylvania	Cowansburg	slide	F.	2 0
9.	Pennsylvania	Port Royal	acc. obst.	P.	2 3
10.	Central N. J.	Edison	acc. obst.	F.	1 0
10.	Oregon-W.	Wasco	.....	F.	2 1
11.	Sharpville	New Wilmington	b. rail	P.	0 1
13.	N. Y. Central	Farnham	acc. obst.	P.	0 2
15.	Baltimore & O.	Cove Run	d. pilot	F.	1 0
17.	Cin. N. O. & T. P.	Chattanooga	bad loading	F.	0 0
17.	Penn.	New Brunsw'k	acc. obst.	F.	0 5
20.	Missouri, K. & T.	Itasca	d. track	P.	0 22
21.	Toledo, St. L. & W.	Marion	tornado	P.	0 3
22.	Kanona & P.	Pratts'g, N.Y.	unx	P.	1 0
24.	Pitts. W. & Somerset	Mechanic's'g	d. track	F.	1 0
24.	Southern	Lawrence'g	beam	P.	1 0
28.	Seaboard A. L.	Sarasota	malice	P.	1 0
29.	Virginia & S. W.	Church Hill	unx	F.	1 0
30.	Balt. & O. S. W.	Flora, Ill.	d. track	P.	1 1

Other Accidents

Date.	Road.	Place.	Cause of Accident.	Kind of Train.	Kil'd. Inj'd.
17.	Atch. T. & S. F.	Manuelito	boiler	F.	3 0
14.	New York Central	Gratwick	boiler	F.	0 2

The trains in collision at Albany, N. Y., on the third were an eastbound first-class train consisting of express cars, and a following freight, the freight running into the rear of the preceding train, which was at a standstill. Three men attending horses in the standing train were killed and one was injured. A part of the wreck fouled a westbound track and a westbound train, consisting also of express cars, was

damaged. The responsibility for the collision is charged against the engineman of the freight, who failed to control the speed of his train properly on a steep descending grade.

The trains in collision near Mountain Lake, Minn., on the fourth were eastbound freights, and the collision occurred within yard limits. The second train, moving under a caution card, approached the station not under control. Three men in charge of cattle were killed and five were injured, one of the five fatally.

The passenger train involved in the rear collision at Schoharie Junction, N. Y., on the night of the 16th, was westbound local No. 306. It was standing at the station and was run into at the rear by a snow plow; and of the 40 passengers in the rear car, 15 were slightly injured. This car was overturned.

The trains in collision near New Richland, Minn., on the 22d were eastbound freights. Two employees and two trespassers were killed and one trainman was injured. The cause of the collision was disregard of signals. There was a blinding snowstorm at the time.

The trains in collision on the Southern Railway near Powder Springs, Tenn., on the 25th were southbound passenger No. 6 and northbound freight No. 51. Two passengers and seven trainmen were injured. Each of the two enginemen had seen the opposing train and had reduced speed somewhat, but the trains were moving at ten miles an hour or thereabouts when the collision occurred. The passenger train had left the last station about 4 minutes ahead of time, because of an error in the engineman's watch, which was fast. The freight train, inferior to the passenger, would have reached Powder Springs and cleared the main track in about 4 minutes longer.

The trains in collision on the Central New England at Canaan, Conn., on the 25th were westbound freights. The leading train had been stopped to take water and the following train came on at uncontrollable speed on a steep descending grade. The caboose of the standing train was wrecked and burned. One brakeman, in the caboose, was fatally injured.

The trains in collision at Menoken, Kan., on the 29th were westbound passenger No. 187 and eastbound passenger No. 190. Both locomotives were badly damaged and five passengers and seven trainmen were slightly injured. The cause of the collision was forgetfulness on the part of men in charge of one of the trains, who overlooked orders.

The trains in collision at Amherst, Ohio, on the morning of the 29th about 3:15, were eastbound passenger No. 86, first and second sections, the second section running into the rear of the first, which had been stopped at the home signal approaching a grade crossing and had been started and had attained a speed of about five miles an hour. The second section had run past distant and home automatic block signals set against it. Twenty-five passengers, one employee and one other person were killed and 37 passengers, three employees and 7 others were injured. A part of the wreck fouled the westbound track and was run into by westbound passenger No. 25, of which train the engine and five cars were thrown off the track. This collision was reported in the *Railway Age Gazette* of March 31, page 763, and April 7, page 787.

The train derailed near Sapinero, Col., on the first was a westbound passenger. One passenger and one express messenger were killed. The derailment was caused by a snow slide in the Black Canon.

The train derailed at Henderson, Ky., on the night of the 3rd was northbound passenger No. 94. It was running at low speed approaching the passenger station. But little damage was done to cars and engine, but the fireman was run over and killed. It is supposed that he fell off the hind end of the tender when it separated from the mail car. The derailment

¹Abbreviations and marks used in Accident List:

rc, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open detailing switch—ms, Misplaced switch—acc. obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P. or Pass., Passenger train—F. or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

is believed to have been due to the presence of frozen mud in the flange way at a much-used public crossing.

The train derailed on the South Dakota Central near Watertown, S. D., on the fourth was a southbound passenger. Two passengers were killed and 13 injured. The train broke through a bridge and fell 26 ft. to the ravine below. The wreck took fire from stoves in the coaches and one of the passengers was burned to death. The bridge failed because it had been weakened by a fire which it is believed had been set by the last preceding train, which had passed in the night, some hours previously.

The train derailed at Cowansburg, Pa., on the 8th consisted of a single locomotive with two tenders. It was running backward. Two brakemen were fatally injured. The derailment was due to a rock which had fallen down the bank at the side of the track and lodged where it was struck by a journal box of the tender.

The train derailed at Port Royal, Pa., on the night of the 9th was westbound passenger No. 23. The engine was overturned and the fireman was killed. The engineman was injured fatally and two passengers less severely. The cause of this derailment was a minor derailment of a car in a freight train which had fouled the track on which the passenger train was traveling.

The train derailed near Edison, N. J., on the 10th was a work train consisting of a locomotive and four cars. The engine was overturned and fell down a bank and the engineman was killed. The derailment was caused by a pony wheel mounting the crossing, evidently from snow that had been dragged into the flangeway by teams. The train was moving so slowly that the work train foreman stepped off the train not knowing that there was any trouble, until he looked ahead.

The train derailed near Wasco, Oregon, on the 10th was a local freight. The fireman and one brakeman were killed and the engineman was injured.

The train derailed on the Sharpsville Railroad near New Wilmington, Pa., on the 11th, was a southbound mixed train and three cars were ditched in a cut. One brakeman was injured. The cause of the derailment was a broken rail, the breakage being due, it is believed, to the shifting of the load on a gondola car.

The train derailed near Farnham, N. Y., on the morning of the 13th was an eastbound express passenger. The engineman and fireman were injured. The engine was thrown off the track by a piece of a broken tire which had come off from the locomotive of a freight train on an adjoining track.

The train derailed at Cove Run, W. Va., on the 15th was a westbound freight. The engine was overturned and one brakeman riding on the engine, who attempted to jump off, was caught beneath the tender and fatally injured. The cause of the derailment was a loose pilot which caught in a frog. It is believed that the pilot had been loosened by striking a rock.

The train involved in the accident on the Cincinnati, New Orleans & Texas Pacific near Chattanooga, Tenn., on the 17th was southbound extra freight No. 687. The accident was at the bridge over Tennessee River at about 10 p. m.; ten loaded cars fell through to the stream below, together with one span of the bridge. No trainman was injured, but two tramps swam out from the submerged cars. The cause of accident was the failure of the bridge, by reason of the breaking of the stakes of a platform car, a few miles north of the bridge. By the failure of the stakes, one of a number of steel beams on the car worked out of place and was turned to the right sufficiently to strike the posts at the right side of the bridge.

Because of the failure of the bridge, the running of through trains had to be suspended for 16 days; and during this time through traffic was sent by way of Harriman, Knoxville and Chattanooga, making a detour of 162 miles. By the

direct route the distance between Harriman and Chattanooga is only 80 miles.

The train derailed near New Brunswick, N. J., on the night of the 17th was a westbound first-class train consisting of 10 express cars. The engine was thrown off the track by a signal bridge, which had spanned the four tracks and which had been blown down by a high wind.

The train derailed near Itasca, Tex., on the evening of the 20th was southbound passenger No. 25, known as the "Katy Flyer." Three cars ran off the rails and five passengers were slightly injured. The cause of the derailment was insecure track at a point where new rails were being laid.

The train derailed near Marion, Ind., on the night of the 21st was westbound passenger No. 5. The train was struck by a tornado and three cars were overturned. The train was running about 50 miles an hour and 20 passengers and two trainmen were injured.

The train involved in the derailment on the Kanona & Prattsburg near Prattsburg, N. Y., on the morning of the 22nd was a southbound passenger. The rear car ran off the track and was separated from the rest of the train; and it fell down a bank. The conductor and two passengers were injured.

The train derailed on the Pittsburgh, Westmoreland & Somerset at Mechanicsburg, Pa., on the 24th was a southbound mixed train. Two freight cars fell down a bank and one employee was killed. The cause of the derailment was irregular track due to frost coming out of the ground.

The train derailed near Lawrenceburg, Ky., on the 24th was westbound freight No. 74. Eight cars fell down a bank. One trespasser was killed. The cause of the derailment was the dropping of a brakebeam.

The train derailed near Sarasota, Fla., on the 28th was a southbound passenger. The engine was overturned and the engineman and fireman were injured. The cause of the derailment was a loose switch, believed to have been maliciously tampered with.

The train derailed on the Virginia & Southwestern at Church Hill, Tenn., on the 29th was an eastbound freight. The locomotive was overturned and the engineman was killed.

The train derailed at Flora, Ill., on the 30th was a westbound passenger; the locomotive was overturned and three coaches went off the rails. The engineman was killed and the fireman seriously scalded. The derailment was due to insecure track where repairs were being made.

The train involved in the accident on the New York Central at Gratwick, N. Y., on the night of the 14th was a southbound freight of the Lehigh Valley. The boiler of the locomotive exploded and the engineman and fireman were injured. The cause of the explosion was low water.

The train involved in the accident on the Atchison, Topeka & Santa Fe near Manuelito, N. Mex., on the 17th was an eastbound freight. The boiler exploded, when the train was running about 24 miles an hour, and the tender as well as the engine was wrecked. The engineman, fireman and one brakeman were killed. The cause of the explosion was low water.

Electric Car Accident.—The only notable accident to electric cars reported in the newspapers as having occurred in the United States in the month of March was a derailment at Wilkinsburg, Pa., on the evening of the first, when two cars, carrying over 100 passengers, became uncontrollable on a steep descending grade and were overturned at a curve. Twenty or more passengers were taken to the hospital.

Canada.—Two collisions occurred in Canada in March, causing the death of seven persons. On the 22d there was a collision of freight trains near Quebec in which four were killed and many injured. On the 23d, near Toronto, an eastbound passenger train of the Grand Trunk ran into a freight train, and three men were killed.

JAMES J. HILL

James J. Hill died at his home in St. Paul on Monday morning, May 29, at the age of 78. His career is commented on elsewhere in this issue.

Frank Trumbull, chairman of the board of the Chesapeake & Ohio, said of him: "You can see his head and shoulders among one hundred million people."

Daniel Willard, president of the Baltimore & Ohio, said of Mr. Hill: "He was easily the greatest man intellectually I have ever known. I should say that the elements which contributed to his greatness were a rugged physique, a strong constitution and a most wonderful memory as evidenced by his ability to recall almost at will, apparently, any incident with which he had ever been acquainted. With such a foundation, together with a keen intellect, he was able to form a clear understanding concerning whatever matters were brought to his attention and he had the courage of his convictions. While Mr. Hill was a great railroad manager—easily in my opinion the master of them all in his generation—he was much more than a railroad builder—he was a philosopher and a statesman in the broadest sense. He was one of the few really great men of his age and the void occasioned by his death is not likely to be filled. Men like Mr. Hill are the greatest assets any country can have and his death means a real loss to all who desire only the common good."

President Howard Elliott, of the New York, New Haven & Hartford, said: "James J. Hill will go down into history as one of the great men of the United States. He was a most remarkable man with a real constructive mind and an unusual ability of looking into the future and pointing the way to policies that are essential to the continued growth and safety of this country and in warning the country of dangers to be avoided. Lord Macaulay said with prophetic vision: 'Every improvement of the means of locomotion benefits mankind morally and intellectually as well as materially, and not only facilitates the interchange of the various productions of nature and art, but tends to remove national and provincial antipathies and to bind together all the branches of the great human family.' Mr. Hill's great life work or adventure, as he himself put it a few years ago, was to help the growth and development of that great productive part of the United States between the Great Lakes, the Rocky mountains, the Columbia river and Puget Sound by furnishing suitable transportation. He has made a lasting impression in the development of that country and in sound business practices applied to the management of railways. He has been great, not only as a railway builder and executive, but also as a financier and economist, having at heart always the true future interests of the country served by the railways of which he was the master mind. It was my good fortune to be closely associated with him from 1902 until 1913 and I learned by personal contact to appreciate the largeness of his mind, the clearness of his vision, and his capacity for great

accomplishment. His death is a very great loss, not only to his family, but to the thousands in the railway service who have been inspired by him to try and do good work, and to the country generally."

Mr. Hill retired from the chairmanship of the Great Northern on July 1, 1912, but he continued actively in touch with the management of the property up to the time of his death.

In June, 1915, the establishment of a professorship of transportation in the Harvard University School of Business Administration was announced, to be known as the Hill Professorship of Transportation. Seventy-four friends of Mr. Hill contributed to the fund to establish this professorship. There were 13 presidents of railroads, 24 bankers, 37 heads of industrial corporations, business men and lawyers. They represented all parts of the country—Boston, New York, Philadelphia, Baltimore, Washington, St. Louis, Chicago, St. Paul, Minneapolis and Duluth, and the states of North Dakota, Montana, Washington and Oregon. In the announcement of the professorship in an article by Howard Elliott in the Harvard Graduates Magazine he said:

"The endowment of this professorship is a tribute to Mr. Hill, to his genius as a railroad builder, as an operating executive, as a developer of his country and its better interests, and as a financier. He has caused the railways in which he has been the master mind to be so skillfully financed as well as to be so efficiently constructed, developed and operated that considered as a whole they are among the most successful in the world."

Mr. Hill celebrated his seventieth birthday on September 16, 1908, at a dinner with 70 men who have been for at least 28 years in the continuous employ of the St. Paul, Minneapolis & Manitoba and the Great Northern, which succeeded it. The dinner was held at the Hotel



James J. Hill

Lafayette, Lake Minnetonka, Minn. On the afternoon of September 16 the William R. Crooks, said to be the first locomotive ever used in Minnesota, was backed into the St. Paul union station. Albion H. Smith, who has been in continuous service on Mr. Hill's railroads since 1868, was engineer, and John H. Lynch, who has been in the service of Mr. Hill's road since 1869, was fireman. The one coach attached to the engine was in charge of W. J. McMillan, a passenger conductor on the Willmar & Breckenridge division of the Great Northern, who has been in the service of the Hill roads since 1879, and assisting him in the capacity of brakeman was Tony Manly, a passenger conductor who has been in the service of the road since 1873. This venerable locomotive was used in hauling Mr. Hill and his party to Lake Minnetonka.

At the time of Mr. Hill's retirement as chairman of the board of the Great Northern the following account of his life was published in the *Railway Age Gazette*:

James Jerome Hill was born on a farm near Guelph, Ont., on September 16, 1838, of Scotch-Irish parents. Under the hard work of the farm he grew up sturdy and healthy. Between 7 and 14 he received a good schooling at Rockwood

Academy, near his home, where he developed a marked aptitude for reading and study. His father's death when he was 14, made it necessary for him to go to work as a clerk in the village store, where, it is said, his first wage was \$1 per week. In 1856, when 18, he set out for California, but within the year found himself on the steamboat docks at St. Paul, where he got employment as a shipping clerk.

He thus became identified, from his first arrival in the northwest, with transportation there; and he also from the first manifested the keenest interest in all that pertained to commerce and agriculture. In 1865 he became St. Paul agent for the Northwestern Packet Company, operating steamboats on the Mississippi river, and two years later, local agent for the St. Paul & Pacific Railway, which operated a line about 10 miles long between the St. Paul wharf and St. Anthony's Falls, built soon after his arrival in that region. Through his work around the docks he had also become familiar with the products and requirements of the territory, and through his friendship and later business partnership with Norman Kitson, who maintained an ox-cart and sledge service to Winnipeg, Mr. Hill very early became acquainted with the conditions of the country farther northwest, to which he made several trips with or for Kitson. While working on the docks he had built up a business of his own of supplying fuel to the boats. This he later developed between 1869 and 1875 as head of the firm of Hill, Griggs & Company, and afterward of the Northwestern Fuel Company. During this time he brought the first boat load of eastern coal to St. Paul from near Peoria, Ill., via the Illinois and Mississippi rivers.

In 1870, with Kitson as partner, he organized the Red River Transportation Company and built two boats. These, in connection with a stage route, established the first through service between St. Paul and Winnipeg. While serving as agent of the railway it fell to his lot to pilot the scientists Louis and Alexander Agassiz, on a trip through the Red river and Lake Superior country, during which he learned something of the mineral wealth of the region, which later led to his extensive investments in mineral lands.

When Mr. Hill first went to St. Paul there was no agriculture north of that point. On his many trips to Winnipeg, on foot or horseback, in ox-carts, on sledges, and later by boat, in all seasons, he became thoroughly acquainted with the character of the country and convinced that the Red river valley could be made to grow wheat in abundance. At the same time he became more and more interested in the vast and almost unexplored territory further west. Meanwhile the St. Paul & Pacific had been extended as far as the Red river, but—under a management that was far more interested in the profits to be made by milking the Dutch bondholders than in its future as a railway—it had deteriorated into the proverbial streak of rust, and in 1873 finally became bankrupt.

This was Mr. Hill's opportunity to carry out some of his ideas that had long been germinating for the development of the country. With Kitson he organized a syndicate to take over the property. Through Donald Alexander Smith, later Lord Strathcona, then agent of the Hudson Bay Company at Winnipeg, they enlisted the support of Smith's cousin, George Stephen, manager of the Bank of Montreal. After an appraisal of the property by a committee representing the Dutch owners they bought the control of the railway at about 40 per cent. of the par value of its securities. It is said the purchase actually required very little cash, being made on option, and paid for out of the proceeds of a bond issue, leaving control of the stock in the hands of the syndicate.

The road was reorganized in 1879 as the St. Paul, Minneapolis & Manitoba. Mr. Hill became general manager and George Stephen president. Mr. Hill was then about 40 years of age. But the years he had spent up to that time in gain-

ing, by constant study and unceasing investigation and observation, a thorough knowledge of commercial and agricultural conditions, had served as the best possible preparation for the work he now undertook. In addition to possessing probably greater knowledge of the conditions of the northwest than any other man, with the possible exception of his partner, Kitson, and to having far-seeing confidence in the possibilities of the country, he had the advantage of becoming interested in this neglected railway at the strategic moment. The vast tide of immigration from the East was beginning to turn strongly toward the northwest, and instead of being content merely to take advantage of the opportunity for present profit which the conditions presented he had the public spirit and the foresight to build for the distant future. He adopted a policy of reconstructing and extending the road, of attracting settlers to the country and of making rates that would encourage agriculture. He sent to England for fine cattle and horses, which were distributed among the farmers on easy terms of payment, furnished them with good seed, and in every way possible aided them to become firmly and prosperously established. Finding difficulty in persuading eastern capitalists to venture their money in his project he was often obliged to secure the necessary capital from abroad.

As the name of his road indicated, his attention was first directed toward opening a rail route through the Red river valley. The spring of 1880 witnessed a great boom in Winnipeg; and the line was rapidly extended to that point. He was one of the first to foresee the great future of the Canadian northwest as a wheat-growing country, and with his Canadian associates was greatly interested in Canadian railway building, being a member of the original syndicate which in 1880 undertook, in consideration of a large government subsidy both of money and of land, to build the Canadian Pacific from Montreal to Vancouver in 10 years. He had not, however, lost his interest in the great country lying immediately west of Minnesota, and in 1883 he definitely adopted this as the territory in which his energies were to be expended. He had continued to be the dominating spirit in the St. Paul, Minneapolis & Manitoba, and in 1882 was elected vice-president. In 1883 he was made president and gave up the last of his holdings in the Canadian Pacific, relinquishing to his associates, Donald Smith and George Stephen, the honor of the execution of that project.

He immediately had surveys made to the Missouri river, extended the line to Minot, N. D., and in 1884 definitely mapped out a route through Montana. In 1887 the line reached Great Falls, Mont., and was then extended 100 miles more to Helena. In 1890 the road was leased to the Great Northern, which Mr. Hill had organized in 1889, and of which he became president and the road was completed to Seattle in 1893. In spite of the difficulty of raising funds for a line paralleling both the Northern Pacific to the south, which had been completed to Portland in 1883, and the Canadian Pacific, which was completed in 1888, a noteworthy fact in this connection is that the Great Northern was built without a dollar of cash government aid, and the original land grant of 3,675,000 acres was far less than the amounts received by other transcontinental lines.

Long before the road was completed Mr. Hill had sent agents to Sweden and other European countries to induce immigration to the territory traversed. This policy increased traffic while the low grades and lack of curvature which he had insisted upon from the first made possible a low cost of operation that soon produced a strong contrast in the financial results of the Great Northern and the earlier Northern Pacific. The latter became bankrupt, and in 1896 the Hill-Morgan interests secured control of it, as Mr. Hill said, in place of double-tracking the Great Northern. While pushing the main line to the Pacific coast Mr. Hill threw out branch lines as feeders in all directions. By 1900 the

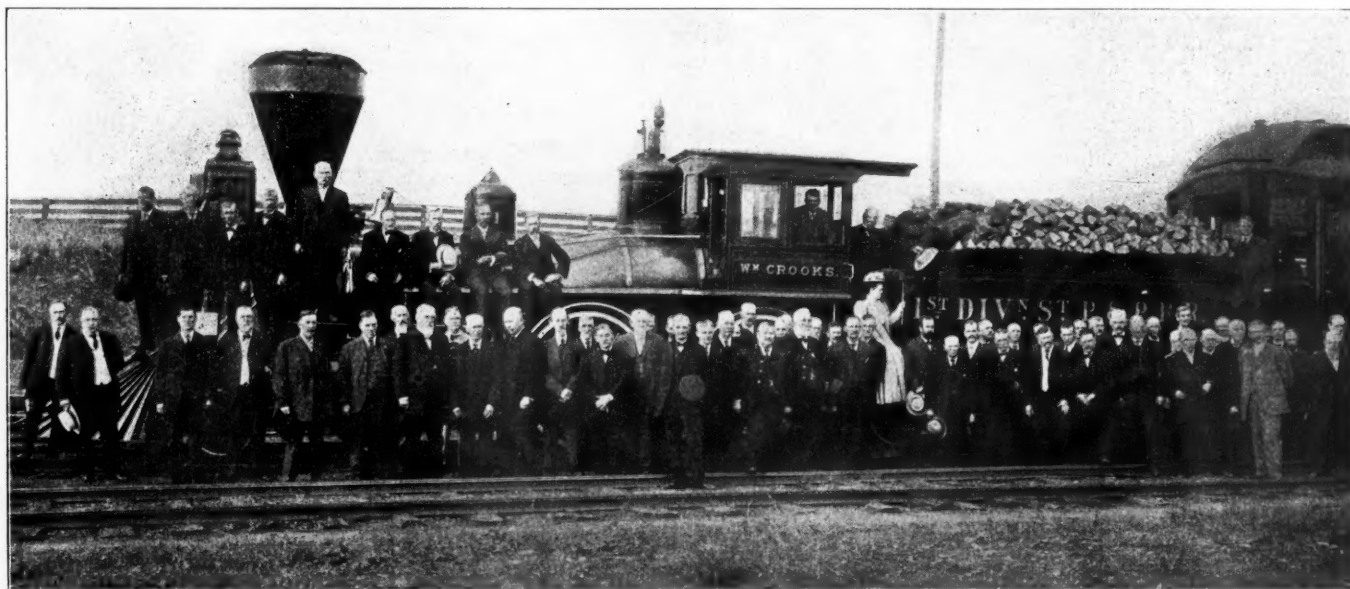
Great Northern system had 5,441 miles of operated line, and the Northern Pacific 5,203 miles.

Mr. Hill was now supreme in his own territory. But to the south of him the Harriman interests were building up another vast system. The two occasionally came into conflict in the border territory. The need for a controlled connection to the East had become imperative to both. Thus ensued the rapid flow of events which led up to the famous Northern Securities decision four years later.

During the fall of 1900 the Harriman interests bought some eight or nine millions of stock of the Chicago, Burlington & Quincy. Hill and Morgan had been trying to secure the Chicago, Milwaukee & St. Paul, but without success. Early in December, 1900, or January, 1901, after the Harriman interests had been similarly unsuccessful in acquiring any considerable amount of Burlington, the Hill interests opened negotiations with the executive committee of the board of directors of the Burlington for the purchase of its entire capital stock. These appear to have become known to the Harriman interests, who forthwith demanded an opportunity to share on equal terms with the Great Northern and North-

was chosen to select a new board for the Northern Pacific in which every important interest should be represented.

It had long been the ambition of Mr. Hill and his associates to form a holding company for both the Great Northern and Northern Pacific which should perpetuate their policy and at the same time treat all stockholders alike. Now, with the active co-operation of the Harriman interests, and to promote permanent harmony, the work resulting in the Northern Securities Company was begun. A long search was made through the state corporation laws for a suitable charter, and on November 13, 1901, the company was incorporated under the laws of New Jersey. Slightly more than 96 per cent of the Northern Pacific stock, including the Union Pacific holdings, and about 76 per cent of the stock of the Great Northern, was exchanged for the stock of the Northern Securities Company on the basis of \$115 per share for the former and \$180 for the latter, the capitalization of the Securities Company at \$400,000,000 being approximately equivalent to the agreed valuation of the constituent companies. Mr. Hill was made president, and the board of 15 directors was composed of six representatives of



The William R. Crooks, the First Locomotive Used in Minnesota, Photographed on the Occasion of Mr. Hill's Seventieth Birthday, September 16, 1908

ern Pacific in the acquisition of the Burlington. The request was refused. In April, 1901, the Great Northern and Northern Pacific became joint owners of the road, paying in collateral joint 4 per cent bonds \$200 per share for the \$108,000,000 par value of Burlington stock.

The Harriman interests then began to buy large blocks of Northern Pacific in the open market with a view to obtaining control of it. In the efforts of the Morgan-Hill interests to recover the stock the price of the Northern Pacific, which in 1896 had been as low as 25 cents, was forced up on May 9, 1901, to \$1,000 a share. When the "show-down" came after that memorable conflict it was found that the Harriman interests had acquired \$78,000,000 out of the total of \$155,000,000 of the Northern Pacific stock. The capitalization of the Northern Pacific was divided into \$80,000,000 of common and \$75,000,000 of preferred. The Union Pacific interests held \$37,000,000 of common and \$41,000,000 of preferred, being a majority of the total, but not of the common stock. At the annual meeting in October the Harriman party could control the election of the board, but in January the preferred could be retired, leaving the Hill party in control of the common, a course which was subsequently followed. During the time which must elapse before the annual meeting this situation led to a compromise. J. P. Morgan

the Northern Pacific, four of the Great Northern, three of the Union Pacific and two unclassified.

Opposition to the Securities arrangement manifested itself immediately. Governor Van Sant of Minnesota called a conference of the governors of states directly affected, and Washington and Minnesota brought suit in the United States Circuit court for the dissolution of the merger. In March, 1902, the federal government also filed suit in the Circuit Court at St. Paul against the combination as in violation of the Sherman anti-trust law, of which the state anti-trust law was an exact counterpart. While the state suit was decided in favor of the company, the government suit resulted in a decision of the Circuit Court enjoining the Securities Company from voting the stock of the railway companies and from paying dividends on its own stock. On appeal the Supreme Court of the United States, by 5 votes to 4, on March 14, 1904, held the holding company illegal.

"The railways are still there," said Mr. Hill. "I have made my mark on the surface of the earth and they can't wipe it out."

So far as forcing the three railways into competition with each other was concerned, the decision had no practical effect. It did, however, restore to Mr. Hill and his associates the control of the Northern Pacific which had been gained by

Harriman in 1901. After the court had ordered the dissolution of the company the directors formulated a plan for the pro-rata distribution of the securities held by it which would have given the Harriman interests a large amount of Great Northern stock in place of the Northern Pacific which had been put into it. Harriman naturally preferred his Northern Pacific, and went into court to get it. After a long period of litigation the Supreme Court decided in favor of the original plan of pro-rata distribution, which left the Hill party in control of both roads, with about 25 per cent of the stock of each, while Harriman held about 20 per cent, and the rest remained in the hands of the public.

In testifying before the Stanley committee during its investigation of the Steel Corporation last February, Mr. Hill said that the Securities Company was formed at a time when he was in "a very tight place."

"I had to raise in three months about \$90,000,000," he said. "If I did not those properties would have been welded in with the Union and Southern Pacific and a bigger combination than ever was made in the country would have been the result."

While building up his railway system, and at the same time building up traffic for it by promoting the increase of agriculture in its territory, Mr. Hill was also building up auxiliary traffic producers by establishing steamship service on the Great Lakes and on the Pacific. It was his ambition to have a great world route across America to the Orient in competition with the Cape Horn route or the Suez canal. This purpose he once explained in a speech which illustrates his ideas of the development of the Northwest. He said:

"Our population is doubling every thirty years. At this rate, during the next 30 years we may grow to 150,000,000. What shall we do with this population? At the most not over one-third can be employed in manufactures, railroading, trades and the professions. The bulk of the remaining 100,000,000 must go to the land. The great increase will be in the valleys of the Ohio, Mississippi, Missouri and westward—the fertile prairies of the great central West and beyond, wherever irrigation is possible. Now, then, what will these 100,000,000 on the lands of the West produce? They will produce the three great staples of traffic—food, fuel and shelter, but food in the main.

"Now cross the Pacific and what do we find? Millions of people, and what can they buy? What can a man who earns a shilling a day, and that is the average wage of the Orient—buy of us? He will buy only what he is compelled to buy to sustain life. The principal demand will be for food—just the products which the present coming population of America's great central and western zone is prepared to furnish. The great traffic proposition is to carry our goods to the Orient, and bring theirs in return. The question is, Will this traffic go by the Pacific or by the Suez and Cape Horn? I hope that America will handle it, and by the Pacific. Geography and nature demand it and trade cannot resist them."

It was in pursuance of this idea that in 1909 the Colorado & Southern was added to the Burlington system and work was at once started on the construction of connecting lines for the purpose of opening a direct route from Galveston to Puget Sound, by which the cotton of the South might be transported to the Orient.

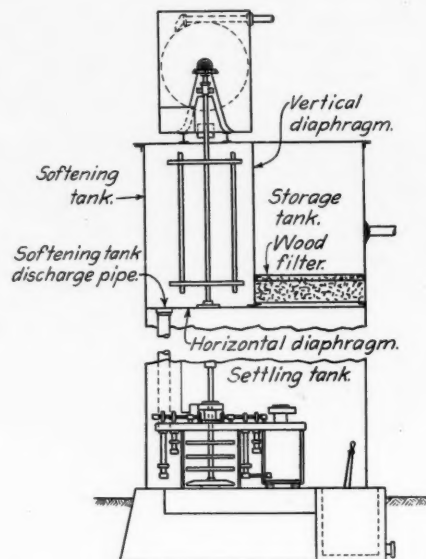
A recent development of the Hill system has been the construction of the Spokane, Portland & Seattle along the north bank of the Columbia river from Spokane to Portland, an example of unusually high class railway construction, which is owned jointly by the Northern Pacific and Great Northern. Mr. Hill has also invaded the Harriman territory by the building of the Oregon Trunk railway up the Des Chutes canyon in competition with the Des Chutes railway, built by the Harriman interests. On account of its direction and the heavy character of its construction it has been often stated that the Oregon Trunk represents the beginning of a line south into San Francisco, but this has been denied by Mr. Hill.

In April, 1907, Mr. Hill, then nearly 69 years of age, retired as president of the Great Northern and was elected chairman of the board of directors. He was succeeded by his son, Louis W. Hill, who had been trained to assume the management of the road, and who had been first vice-president since 1903.

A NEW TYPE OF WATER SOFTENER

A patent was recently issued for a continuous water softener which is arranged somewhat differently from those now in common use. The principal advantage gained in the new type is a settling space of simple and unobstructed design.

As shown in the accompanying drawing, the water softener consists essentially of a cylindrical tank divided by a horizontal diaphragm into two cylindrical sections, one above the other. The upper and smaller section is divided vertically into two segments, forming three separate compartments each fulfilling an independent function. One of the upper segmental sections serves as a softening tank where the water is mixed with the chemicals and agitated. The entire space below serves as the settling compartment and is a simple



Part Section and Elevation of the Water Softener

cylinder unobstructed except for a pipe of relatively small section extending from the softening chamber to within a short distance of the bottom of the settling space. This arrangement permits the slowest possible upward flow, thus greatly facilitating the process of sedimentation.

The other segmental space in the upper portion of the tank contains the finishing filter and also affords a considerable space for the storage of the softened water. This form of water softener is being placed on the market by the L. M. Booth Company, New York, and is equipped with regulators and operating equipment similar to those used on the type F8 softener of that company.

FATHER AND SON IN SERVICE OF NEW YORK CENTRAL FOR EIGHTY YEARS.—Charles F. Moseley, New York Central ticket agent at Bergen, N. Y., on April 2 completed 50 years of service in the employ of the company, the last 31 years as ticket agent. He succeeded his father, Francis T. Moseley, who had been ticket agent since the road was put through in 1836 and who died August 5, 1885, the office having been held by father and son for 80 years.

ENGLISH RAILWAY EMPLOYEES TO STUDY FRENCH.—The directors of the Great Western Railway (England) who, taking the view that after the war England will be a popular holiday resort for England's allies, and especially its immediate neighbors across the channel, have instituted classes at Paddington for the teaching of French to station-masters, inspectors, guards, and ticket collectors in the company's employ.

The Boiler Makers' Association Convention



Reports on Electric Welding in Boiler Repairs, Maintaining Superheater Flues and Renewing Fireboxes

A Group of Attendants at the Cleveland Convention

A REPORT of the first day's proceedings of the tenth annual convention of the Master Boiler Makers' Association appeared in the May 26, 1916, issue of the *Railway Age Gazette*, page 1142. At the second session of the convention Frank McManamy, chief inspector locomotive boilers, Interstate Commerce Commission, delivered an address, from which the following is taken:

A review of the subjects discussed at its various meetings indicates that much constructive work may be accomplished by this association. Its value, however, will be largely if not entirely governed by the accuracy and reliability of the reports submitted, on which the action of the convention is based. Nothing will do more to prevent this association from attaining its legitimate and proper position as a leader among authorities on boiler work than presenting matter to the convention as the conclusions of committees that is not based on actual and accurate tests or performance records.

This association or its members can do a great deal to promote safety. The men of whom it is composed have charge of large shops and many workmen who are engaged in the construction and maintenance of locomotive boilers and their appurtenances, and are therefore responsible in a great measure for the safety, not only of the workmen who construct, but those who operate the product. No industrial operation is of sufficient importance to justify the unnecessary loss of human life in its accomplishment.

The amendment to the Federal laws of March 4, 1915, extending the work of the Federal inspectors to the entire locomotive and tender, as well as to the locomotive boiler and its appurtenances, has made absolutely no change in the Federal locomotive boiler inspection law, and none in the method of its enforcement. It is true it has added to the duties of Federal inspectors, and perhaps will make it impossible for them to inspect so many locomotives, but no change will be made in the method of handling the work under the locomotive boiler inspection law.

ELECTRIC WELDING IN BOILER REPAIRS

Most of our electric welding has been confined to the welding of flues. Since the installation of two one-man machines at Mount Clare, on each of which we have been running

three eight-hour shifts, we have welded flues for 754 engines, 178,890 tubes, and 12,206 superheater flues. This was from July, 1913, to October, 1915.

We have welded a side sheet on a yard engine which has been in continual service since 1913, and the sheet is as good now as when welded as far as the weld is concerned. The firebox of one engine on our road has been welded complete.

To get good results, the machine should control the voltage so as to keep it uniform at the weld. Fluctuations in the voltage or amperes mean a difference of temperature at the weld. A weld will not be uniform throughout under such conditions. An automatic controller should be gotten up to control the voltage at the operator's hand. Without proper wire it is very hard to make a good weld, and a great many of the cracked welds are due to bad wire. We are now using a Swedish iron with good results. When welding a crack, the section of crack should be built up, and should be greater than the plate thickness by about $\frac{1}{8}$ in. or 3-16 in. All parts to be welded must be thoroughly cleaned with a roughing tool or sand blast. The latter is preferable when it can be used, as it removes all foreign substances.

The welding of tubes is very important. It is our practice to set all tubes back to head prior to welding, and the boiler must be steamed before welding so as to burn all the excess oil under the bead. If this is not done, the weld will be porous, due to the oil coming out as soon as the welding begins. When welding flue sheets, door sheets, and door necks with electric weld, all the caulking edge must be chipped and cleaned with a roughing tool. All fire-cracks must be chipped to 45 deg. bevel. All the work must be caulked with roughing tool to close all pores in the metal after welding. If possible weld the tubes with water in the boiler. The water keeps down expansion and contraction of the tube and head and also exposes all defective welds.

Fireboxes can be welded successfully instead of riveting. Make the welds come in between the first and second rows of stay-bolts, which will stiffen them. To do this the flue sheet and door sheet flanges must be deeper. All shell patches can be welded along the edge, which will prevent trouble from leaks.

The average time to weld a set of tubes $2\frac{1}{4}$ in. in diam-

eter is at the rate of about 20 an hour; for superheater flues, about 6 an hour. It takes about four hours to weld around the caulking edge of a tube sheet measuring about 18 ft. over all, averaging about 40 in. an hour steady welding.

The electric welding process can also be used on smoke-box connections, especially where the smoke-box and extension are in two pieces, thus preventing the possibility of burning and warping the plate, due to air leaking in. Patches can also be welded in smoke-boxes damaged in accidents. This method is safe and reliable and cheaper than riveting or acetylene welding.

The following information on the welding of steel plates was obtained from the Lincoln Electric Company:

A welded piece of sheet metal will consist of two grades of metal: the original metal which has received mechanical treatment and the metal added by the welding process which has not received mechanical treatment and will always have, in general, the characteristics of cast steel.

From the foregoing several general conclusions may be drawn: First, the tensile strength of the cast steel in the weld may be made less than, greater than, or equal to the tensile strength of the metal in the original section; second, the metal may be harder or softer than the metal in the original piece; third, the elasticity of the metal in the weld will always be less than the elasticity of the metal in the original plate.

The character of the finished weld depends on the composition of the metals being welded and upon the skill of the operator. A weld is made when the metals to be welded are in the liquid state with the slag and oxide floating on top. Flaws and imperfect welds in steel are due to the fact that the metals were not properly liquefied and the presence of the oxide or slag, or both, prevent a perfect union. It is a notable fact, however, that in autogenous welding the actual union is made in plain view of the operator, so that if it is not perfect, he knows it.

The single riveted lap joint is 55 per cent efficient under the most favorable conditions, while the quadruple riveted double strap joint may have an efficiency as high as 85 per cent. A skillful electric arc welder will make a joint which has an efficiency of 90 per cent without particular effort. Stiffness equivalent to that of the riveted joint may be produced by making the section of the joint greater than that of the unwelded section.

At the present time two kinds of electrode are in general use on sheet metal work: Norway or Swedish iron, or American equivalent, and low carbon steel wire. The iron wire gives metal in the weld of a tensile strength of approximately 40,000 lb. per sq. in., while the steel of .10 carbon content may be relied upon to produce metal in the weld of a tensile strength above 50,000 lb. per sq. in. An iron electrode may be melted more rapidly than one of steel and has less tendency to burn than the steel. In general, however, it is more difficult to weld with an iron electrode than with one of steel. To get the best weld possible, the current density in the circuit should be kept as low as is consistent with a usable arc.

The report was signed by P. F. Gallagher, chairman.

DISCUSSION

The discussion of this report was largely on the welding of tubes at the firebox tube sheet, to which electric welding has been extensively applied. There has been no difficulty in securing excellent results in good water districts, but where bad water is used the results have been much less satisfactory. When the welded tubes begin to leak and are worked over, the welds of adjacent tubes which were previously in good condition are loosened and the trouble rapidly spreads. In some cases, where bad water is used the tubes are welded because of the decreased amount of roundhouse work required while the welds last, although the life of the tube is not greatly extended. With coals which tend to honeycomb the sheet some difficulty has been experienced with welded tubes,

the increased thickness of the bead due to the weld tending to increase the accumulation of honeycomb and the number of steam failures.

E. W. Pratt, assistant superintendent motive power and machinery, Chicago & North Western, showed a number of samples of the method being used on that road to weld tubes in the firebox tube sheet. A shallow recess is cut in the sheet around the tube hole in which fits a shoulder on the end of the tube, making the end of the tube flush with the tube sheet before welding. The weld is then built up on the end of the tube and the sheet, thus making it possible to remove the tube by chipping off the weld. The tube is set with a copper ferrule.

On the Union Pacific where firebox sheets are electrically welded the practice of dropping the sheet $\frac{1}{8}$ in. per foot was originally followed, it being found that at the completion of the weld the sheet would be drawn up into place. It was found, however, when the weld was pounded lightly with a hammer as the work proceeded, that the sheet did not take up. The strain on the weld had apparently been relieved by the pounding. This practice has therefore been adopted, the sheet being placed with no allowance for contraction.

THE BULGING OF FRONT TUBE SHEETS

The sheets have a very small amount of material to assist in keeping them straight. The amount of work and the tools used, as well as the experience of the man doing the work of putting in the tubes, governs the bulging of the sheet, which the following record and experiments will show.

By using hand rollers each hole stretched .007 in. With the self-feeding roller and hand pin the hole stretched .029 in. With the self-feeding roller and air motor the hole stretched .021 in. By taking as a basis a tube sheet having 400 holes, the first method stretched the holes $400 \times .007$, which equals 2.8 in. The second operation stretched the holes $400 \times .029$, which equals 11.6 in. The third operation stretched the holes $400 \times .021$, or 8.4 in. The amount of excess material is distributed over the space worked upon.

As the bridges between the flues do not upset proportionately to the increase in the sizes of the holes, to do the stretching of the material at certain points each individual hole must take care of a portion of the material around it, thus making the bulging of the sheet a local condition. This test was made with a $\frac{1}{2}$ -in. sheet and a 2-in. tube, .135 in. thick.

The report was signed by J. B. Tate, chairman, John Smith and Martin Murphy.

DISCUSSION

Methods of overcoming the bulging of front tube sheets or reducing its bad effects to a minimum vary. Some members considered the bulging itself to be of little consequence if proper care were exercised in working the tubes, but they have had trouble from cracking at the heel of the flange. To overcome this the thickness of the sheet has been increased to $\frac{3}{4}$ in., a $\frac{5}{8}$ -in. firebox tube sheet being used. Others consider it only necessary to keep the back tube sheet straight, and let the front tube sheet go as it will. The use of a tube sheet with a corrugation adjacent to the flange around the belly of the boiler and over the top of the tubes was suggested as a means of taking up the expansion in the sheet without bulging.

CLEANING AND MAINTAINING SUPERHEATER FLUES

Keeping superheater flues free from cinders and clinkers depends upon the roundhouse forces, and more particularly upon the boiler foreman and inspector. It should be required that the clinkers and cinders be removed at the end of each trip. Steel bars from five to eight feet long with a chisel point should be used to break up the clinkers and honeycomb off of the end of the unit and other bars with hooks at the

ends should be used to pull the clinkers out of the tube. If they are blown back into the flue they are liable to lodge on the supports of the unit pipes and will soon clog the superheater flues. The best time to clean the superheater flues is, of course, at the washout period when the engine is cool, but this depends upon the grade of coal used, for with the use of some coal it is necessary to blow and clean them each trip.

As it is not necessary to remove the superheater tubes at the end of the three-year period in order to comply with the law, if the boiler can be cleaned and inspected, it is recommended by many railroads that the superheater flues be welded at the fire-box end. The flues can be cleaned on the outside or water side while in the boiler by the use of scraping rods and bars, pneumatic flue cleaners, and sometimes by heating the flues.

When it is necessary to safe-end superheater flues, many railroads recommend that not over one safe end be used. When the old safe end is cut off each time it is at least possible to re-tip the tube three times. After that they can be cut down for shorter engines. It is the recommendation of this committee and other boiler foremen that the safe end go on the fire-box end, where the condition is more severe, and where the new material is most needed.

There has been a tendency on the part of some designers to crowd the corner superheater flues too close to the flange of the back flue sheet. This has resulted in cracks out from the flue hole which can only be repaired by welding. Where the welding does not hold, it is necessary to renew the flue sheets. It is recommended that the outside edge of the superheater flue hole be kept at least three inches from the inside of the flue sheet flange.

The report was signed by T. F. Powers, chairman, and W. M. Wilson.

DISCUSSION

The importance of thoroughly and frequently cleaninginders from the inside of superheated flues was emphasized. This is necessary to realize the full benefit of the superheater.

Thoroughly cleaning the scale from the outside of the flues while they are in the boiler has been found difficult with some kinds of water. Although they cannot be cleaned as well as when removed they usually can be made to go until the second shopping for the removal of the small tubes. In rattling the large flues in the barrel type rattler it has been found that they can be handled without injury if the rattler is as completely filled as possible. In rattlers of the submerged type the mixing of 2-in. or 2¼-in. tubes with the flues has been found to prevent denting and flattening of the latter.

REMOVING AND REPLACING WIDE FIREBOXES

After removing all tubes, the boiler should be taken from the cylinders and frames and placed on the floor in the boiler shop, all stay and crown bolts drilled out with air drills, or cut off with the electric or acetylene process, cutting mud-ring rivets off with hand chisels or punch and sledge, or by the use of an air hammer or rivet buster; then break the staybolts down with a staybolt breaker or leave them in the old fire-box sheets, dropping the sheets or pieces of sheets on the floor. After this has been done all stay and crown bolt burs can be cut or burned out of the holes. All necessary repairs to the cylindrical parts as well as the fire-box sheets are made and the sheets cleaned while the new fire-box is being fitted up, riveted and caulked.

In applying these fire-boxes the committee differs some as to the manner in which this work should be done. In some localities the sheets are applied one at a time, and bolted up inside of the fire-box casing. Where the fire-boxes are applied in this manner, the rivet holes are all countersunk and rivets driven on the inside of the fire-box by the use of air hammers. It is claimed that by this method the flanges of

the sheets are protected, and there will be less trouble on account of sheets cracking out at the rivet holes. It is the opinion of a great number of men that the boiler should be removed from the frames and taken to the boiler shop. When this is done the fire-boxes should be fitted up, riveted, chipped and caulked, both inside and outside, ready to be put into the casing by the time the boiler has been cleaned and repairs made to the barrel and outside fire-box casing sheets. The fire-box can then be put in place, if cranes are available, by turning the boiler with the mud-ring opening up.

The committee does not think it advisable to cut the back head out or disconnect the boiler at the throat sheet at any time to remove any wide type fire-boxes. This is not only an unnecessary expense, but it will destroy a good tight seam or joint. The driving out of the rivets is liable to cause fractures and cracks in the plates. Any wide type fire-boxes can be removed and applied without disconnecting the boiler at throat sheet, or cutting out the back head, by one or the other of the above methods, i. e., by applying the boxes after they have been riveted together, or by putting in one sheet at a time and riveting all inside of the boiler. The only objection to the latter method is that the sheets cannot be brought up tight on the water side, and it is impossible to caulk them.

The report was signed by B. T. Sarver, chairman, A. N. Lucas and Bernard Wulle.

CUTTING OFF STAYBOLT ENDS WITH OXY-ACETYLENE

The threads on the staybolts or on the sheet are unduly strained by the use of nippers, and the ends of the staybolts are left with two long corners, making them more difficult to rivet over. The chisel bar and sledge are 50 per cent worse than the nippers in the amount of damage done to the threads in the sheet and on the staybolt.

The advantages of cutting off ends of staybolts with oxy-acetylene are: First, the bolts are not disturbed after they are once applied; second, we get a uniform length to drive without long corners, and, third, the heat anneals the end of the staybolt. This is a great advantage in the riveting, as the operator is better able to do a good job in upsetting the bolt without leaving any ragged edges. As all staybolts are applied from the fire side of the fire-box, this is a great advantage where a first-class job is desired. Some may think that by cutting off staybolts in this manner, the heat penetrates through the bolt to the fire-box sheet, but this is not so, as the operation of cutting is done so quickly the heat does not have time to reach the sheet.

The report was signed by Thomas Lewis, chairman, and W. G. Bower. A minority report was presented by L. Borne-man, a member of the committee, from which the following is taken:

I have been unable to cut off very many staybolts with oxy-acetylene, but I have cut off a sufficient number to prove that we cannot cut them off as cheaply as we can with the staybolt nippers. One-half hour is all the time required for cutting one side of our largest engines, which are of the Mikado type. We have one man rated at 26½ cents an hour who handles the nippers exclusively with a helper receiving 23½ cents per hour. In cutting the bolts with oxy-acetylene the sheet gets so hot that it is impossible to place the hand on it in some places.

It may be recommended as inexpensive on general repairs to use oxy-acetylene in cutting off a number of bolts scattered on the boiler and as preferable to using a chisel bar.

I do not recommend the application of bolts from the inside sheet. In tapping out a staybolt hole with a motor, the vibration of the motor hanging from a pulley has a tendency to increase the size of the hole where first entered. When entering the bolt, it will always be noted that it will not be as tight in the hole that the tap was first entered in as in the second hole; thus you are able always to get a good tight

bolt on the inner sheet where it is absolutely necessary in order to prevent leaky staybolts, by applying the bolts from the outside sheet.

DISCUSSION

Where the use of the oxy-acetylene burner has been tried in the removal of staybolt ends it has usually proved successful. Where difficulty has been experienced due to the hardening of the bolt ends or heating of the sheets, it is attributed to improper regulation of the flame.

BASIC VERSUS ACID STEEL FOR FIREBOXES

Acid open hearth steel is believed by engineers to be better than basic, and is usually specified for all important structures, although not so rigidly today as a few years ago. The basic process is less expensive than the acid, because high phosphorus pig iron and scrap are cheap, and the lower cost of materials used more than balances the greater cost of the basic lining and lime additions, and the circumstance that the acid furnace has a higher output because heats are shorter. Acid steel is preferred for the following reasons:

A basic slag will dissolve silicon from the metal; therefore, the recarburizer is added to the steel after the steel has left the furnace, instead of in the furnace as in the acid process. Should any basic slag be carried over with the metal, however (which is liable to happen), there is the danger that the ingots will be too low in silicon. They are then impregnated with blow holes. A goodly portion of the acid open hearth steel goes into steel castings, where the presence of blow holes would be injurious.

The recarburizer does not mix with the steel as well as if it were added in the furnace.

A basic slag is more highly oxidized than an acid slag, therefore the metal at the end of the operation is more highly charged with oxygen. For this reason a larger amount of manganese is added in the recarburizer.

It occasionally happens in the basic process, after the phosphorus has all been oxidized in the slag and the operation is ended, a good deal may get back into the metal again. This is especially liable to happen when basic slag is carried over into the ladle before the recarburizer is all in. A reaction may then take place between the basic slag and the acid lining of the ladle, the slag being enriched in silica, and phosphorus forced out of it into the metal.

The committee made no recommendation endorsing either process as the best for the manufacture of fire-box steel. The report was signed by J. C. Clark, chairman, and H. J. Rapps.

CRACKING OF BARREL SHEETS

Barrel sheets are likely to crack in any part of the boiler, but cracks occur most frequently in the lower part of the boiler at the girth seams, usually running in girth seam direction. This is caused by pitting or corrosion. Cracks also occur on the lower half of the boiler where frame braces or tee irons are riveted or studded to the barrel sheets. The sheets generally crack at the end of the tee or angle irons, the crack running lengthwise of the boiler. We believe the cracks found here are due primarily to bad condition of the machinery, such as bad pounds or broken frames, causing undue strain upon the barrel sheets.

Cracks occur at the longitudinal butt joint seams between the rivet holes, in a longitudinal direction, or at the edges of outside welt straps, in a longitudinal direction. These cracks are either due to improper design of the boiler, bad workmanship, or possibly poor material, mostly to bad workmanship. Either the sheets have not been properly rolled or the rivet holes have not been drilled and carefully reamed.

Cracks also occur where washout plates are applied to the bottom of the boiler. This is caused by decreasing the strength of the sheet in cutting away the washout hole.

The only way to prevent cracking at the bottom of boiler at girth seams is to keep the bottom of the boiler free from

the impurities which cause pitting and corrosion. Cracking of barrel sheets where frame braces and tee irons are riveted or studded to the sheets can be overcome to some extent by applying reinforcing plates to the inside and the outside of the boiler where the braces or tee irons are located. Cracking at the longitudinal butt joint seams can be overcome by greater care in rolling the barrel sheets and properly drilling and reaming the rivet holes. Cracking at washout plates can be overcome by applying reinforcing plates on the inside and outside of barrel sheets where the washout plates are applied.

The report was signed by C. R. Bennett, C. N. Nau and Joseph McAllister.

DISCUSSION

The point receiving the most attention was the cracking of the barrel where waist sheet angle or tee irons are attached, this being attributed to interference with free expansion and contraction. On the Chicago & North Western the angles are being applied without rivets, a wearing pad being attached to the boiler shell against which the angle rests. On Mallet type locomotives the weight of the boiler, which rests on the forward carrying saddles, under certain conditions is considered excessive for the sheet, causing a tendency to spring the barrel and start cracks. The importance of properly lubricating the expansion pads was mentioned, the boiler shell being subjected to excessive stresses when the pads stick.

CLEANING BOILERS WITH TUBES REMOVED

The ordinary method of cleaning scale out of boilers is by the use of the pneumatic hammer with special scaling tools. A light, rapid hitting hammer is believed to be more profitable than an ordinary size hammer, such as is generally used around the boiler shop or roundhouse, being both quicker and less liable to scar the plates.

The conclusions of the committee are:

First—When tubes have been removed the boiler can ordinarily be cleaned by the use of the air hammer scaling tools in from 8 to 15 hours. Where the fire-box has also been removed it will require about five hours longer.

Second—The picks and air tools should not be sharp enough or hit hard enough to scar the metal, not because of any liability to increase pitting, but because the roughened surface is liable to make the next job of cleaning more difficult.

Third—The sand blast method, taking into consideration the cost of sand and apparatus and its maintenance, is no cheaper than the other method. The boiler is much more uniformly cleaned, however. The system might be profitably employed where special facilities, such as a cleaning pit with crane service to bring the boiler to it, could be provided.

The report was signed by George Austin, chairman; T. J. Reddy and C. C. Dean.

DISCUSSION

Where the wet sand blast process is used it is necessary to have a fine gravel as sand will not operate successfully. Where the sand blast is used, either wet or dry, it is impossible for any other work to be done around the boiler while the cleaning is in progress.

BEST MUD-RING TO USE TO KEEP SIDE SHEETS FROM CRACKING

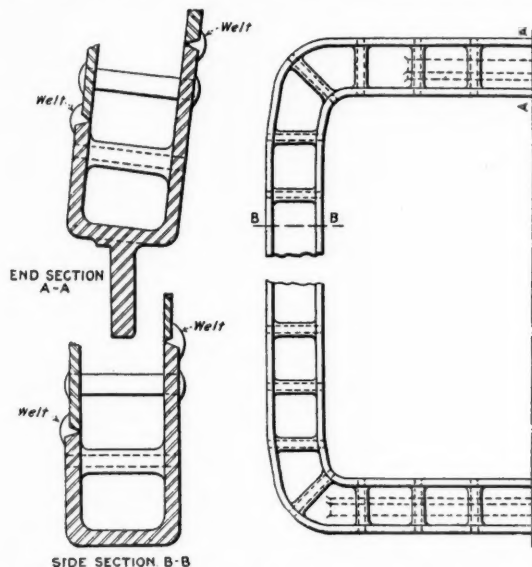
The illustration shows a cast steel mud-ring invented by W. C. Smith, assistant mechanical superintendent, and Charles Harter, mechanical engineer, of the Missouri Pacific:

This ring is channel shaped with flanges on each side to take the fire-box sheets, the inner flange being half a stay-bolt pitch shorter than the outer flange in order to keep the seam below the fire-line and also to secure a row of staybolts in the casting and sheet in order to take care of the stresses in the welds.

To secure the two walls from spreading and give required stiffness at the bottom of the ring, braces are cast between the

walls. In these braces a $\frac{1}{2}$ -in. hole is cored to lighten the casting.

A mud-ring of this description will have many advantages over the present ring in use. Being very much lighter in construction naturally makes it more flexible and eliminates



Cast Steel Mud Ring Developed on the Missouri Pacific

stresses in fire-box sheets caused by the rigidity of the present design. With the mud-ring welded it should also eliminate all mud-ring corner trouble, which is very annoying as well as costly to railroads in bad water districts.

The report was signed by T. P. Madden, chairman.

DISCUSSION

In presenting the report, Mr. Madden stated that some modifications have been made in the design of the mud-ring since the drawing accompanying the report was made, the bottom of the ring having been changed from a straight to a semicircular form. It is expected that an engine will be equipped in the near future.

OTHER BUSINESS

Reports were also presented on the following subjects: The Best Rules to Follow in Arriving at the Maximum Heating Surface; Oxy-Acetylene Welding in Boiler Repairs; Do Long Tubes Vibrate? and Fusible Boiler Plugs.

An invitation was extended to the association by E. W. Pratt, superintendent motive power and machinery, Chicago & North Western, on behalf of the American Railway Master Mechanics' Association, to send a representative to the convention of the latter association at Atlantic City in June.

On Thursday the convention was addressed by J. T. Carroll, assistant general superintendent motive power of the Baltimore & Ohio, and L. R. Pyle, fuel supervisor, Minneapolis, St. Paul & Sault Ste. Marie. Mr. Pyle called the attention of the association to the growing importance of the spark arrester problem because of laws being enacted in some of the states which seriously interfere with the operation of the locomotive. He urged that the association give this subject attention from the boiler maintenance standpoint in order that there might be reliable information on record for use in combating unreasonable legislation.

The secretary's report showed a membership of 426 at the opening of the convention, and during the convention 61 applications for membership were received. The treasurer reported that the total receipts during the year were \$1,130, with a balance on hand at the close of the fiscal year of \$553.88.

The following officers were elected for the ensuing year: President, D. A. Lucas, C. B. & Q.; first vice-president, John B. Tate, Penn. R. R.; second vice-president, Charles P. Pat-

rick, Erie; third vice-president, Thomas Lewis, L. V.; fourth vice-president, T. P. Madden, Mo. P.; fifth vice-president, E. W. Young, C. M. & St. P.; secretary, Harry D. Vought; treasurer, Frank Gray, C. & A. The following were elected members of the executive board to serve for three years: L. M. Stewart, Atlantic Coast Line; John Harthill, New York Central, and John Rapps, Illinois Central.

The retiring president, Andrew S. Greene, was elected to serve as the association's delegate to the convention of the American Railway Master Mechanics' Association.

THE BOSTON & MAINE REORGANIZATION

A reorganization committee for the Boston & Maine has been formed which consists of three members of the board of directors of the Boston & Maine—Henry B. Day, of R. L. Day & Co.; Charles P. Hall, vice-president of the American Hide & Leather Company, and Charles Sumner Cook, a lawyer from Maine, of the law firm of Symonds, Snow, Cook & Hutchinson, representing large minority stockholders. The Fitchburg is represented on the committee by Gordon Abbott, chairman of the board of directors of the Old Colony Trust Company; Alvah Crocker and Moses Williams, Jr. The Boston & Lowell is represented by Phillip Dexter and Charles Francis Adams. It is expected that the Connecticut River and the Concord & Montreal will appoint committees to confer with this reorganization committee. The roads included in the reorganization plan are the Boston & Maine, the Boston & Lowell, the Fitchburg, the Concord & Montreal, the Connecticut River, the Manchester & Lawrence and the Lowell & Andover. No official announcement of the reorganization plan has been made, but the following, which appeared in the Wall Street Journal, is understood to be in substance the outline of the plan on which the committee is working:

Directors of the Boston & Maine have before them a plan for the reorganization of the company, drawn up by the reorganization committee. It proposes to form a new corporation which shall acquire the properties of the old company and its subsidiaries, also the Hampden Railroad. The new corporation would issue \$17,062,000 6 per cent first preferred stock, \$13,149,800 second preferred 6 per cent and \$39,505,100 common stock.

Second preferred and common issues are to be issued for the property of the old company, the first preferred to be issued for cash at par, with rights of subscription to the stockholders of the old company.

Additional amounts of first preferred stock would be issued to be exchanged for the guaranteed stock of the leased lines, dollar for dollar, but to bear different rates of dividend according to the rates now paid upon the leased line stocks. Thus, holders of Fitchburg Railroad stock would receive \$18,860,000 5 per cent first preferred; Boston & Lowell holders, \$7,117,500 8 per cent first preferred; Concord & Montreal holders, \$7,917,100 7 per cent first preferred, etc. It would require \$42,477,900 first preferred to exchange for the leased line stocks, in addition to the \$17,062,000 6 per cent first preferred to be issued for cash, or a total of \$59,539,900 first preferred.

To acquire the Hampden Railroad it is proposed to issue \$1,660,000 5 per cent first preferred and \$1,400,000 5 per cent second preferred stock. The funded debt would be \$99,202,000.

J. P. Morgan & Co., Lee, Higginson & Co. and Kidder, Peabody & Co. have agreed to underwrite the \$17,062,000 first preferred stock to be sold for cash and \$15,000,000 of new 5 per cent bonds.

Judge Marcus P. Knowlton, a member of the Federal board of trustees now in control of the Boston & Maine, disapproves of this plan and has issued a statement setting forth his objections. In part Judge Knowlton says:

I think it my duty to present and place on file a state-

ment in writing of some of my objections to the proposed plan of reorganization of the Boston & Maine, as it has lately been put in print by the committee on reorganization, for the information of the directors and stockholders.

This is not the plan approved by the vote of the directors a copy of which was sent to the stockholders on February 11, 1916. That plan was for a reorganization under the first part of the Massachusetts Act of 1915, which would continue the Boston & Maine in existence, with the changes produced by the consolidation with it of subsidiary corporations and would continue the stockholders as owners of stock in that corporation, whether they elected to subscribe for preferred stock, or to make a payment in money of \$5 a share of their ownership into the treasury, or to give up one-fifth of their stock.

The plan now proposed is to form a new corporation under the later sections of the same statute, in which, under section 10, the first proceeding must be a vote of the directors that they deem it impracticable to reorganize the Boston & Maine system under the earlier sections of the act, and that a new corporation is necessary in the public interest to purchase or take over the property and franchises of the Boston & Maine, etc.

This plan contemplates a winding up of the affairs of the Boston & Maine and a termination of the active life of that company, and the transfer of all its property for the benefit of its creditors and for the use of the new company. Under existing laws, this plan cannot be effective to accomplish the purposes intended without a receivership and a disposition of the property of the Boston & Maine under a judicial decree. Certainly, that part of the property which is in the state of New Hampshire, and probably that which is in the state of Maine, cannot be acquired, managed and controlled by the new corporation, unless it is obtained through a receivership.

Nearly three months ago the directors sent to the stockholders a solicitation of their approval of the plan voted. A self-appointed committee also sent to the stockholders their appeal for signatures to a conditional agreement to deposit stock and to give proxies to be used in voting in favor of this plan, and later a banking firm, expecting to be an underwriter in support of the plan, also sent similar solicitations for a like purpose.

I suppose it is unquestioned that any stockholder who signed such an agreement may, by a seasonable revocation of it, retain his right to vote hereafter at a meeting of stockholders, either in person or by a new proxy, as he may then think his interest requires. It will be a considerable time, at the best, before stockholders will be called upon to vote upon any plan of reorganization, and they may now think it prudent to take measures to preserve their rights for such action as future conditions seem to require.

Many persons fail rightly to understand the relations to each other of the leased line as one party, and the stockholders of the Boston & Maine as another party. In the first place the Boston & Maine is insolvent. Its bankruptcy has been declared publicly by its president and by other officers at different times. To say nothing of other matters, it owes a floating debt of more than \$13,000,000, which has been renewed and postponed again and again, and which will become due in a few days, and which it has not the means to pay. It is liable on an indebtedness of nearly \$5,000,000 more in connection with leased lines which becomes due at the same time. The very large earnings which it has been receiving lately help to offset the former gradually increasing deficit; but such increased earnings are now common to most of the great railroads of the country, and are generally thought to be largely from temporary causes. In the present case they have been in part produced by the practice of strict economy and the postponement of expenditures.

In the opinion of well-informed persons, one of the important reasons for seeking relief is the rents which are called for by leases made when the net earnings and dividends of railroads were much larger than they are now, and when the railroads were free from any of their present heavy burdens.

When the Boston & Maine goes into the hands of a receiver, either in accordance with this proposed plan or in spite of it, it will be as an insolvent or bankrupt corporation. Under such conditions, a lessor railroad corporation has its claim like any other creditor, for the accrued rent; but for the future, if the receiver declines to continue the lease, as ordinarily, in the absence of a proper agreement he ought to do, a lessor corporation, if the lease is in common form, must elect one or two remedies: It may terminate the lease for a breach of the condition and take back all its property and use it as if no lease had been made, or it may leave it unused under the lease and sue for the rent from time to time, as it accrues. Ordinarily this latter remedy against an insolvent corporation is of no practical value, and the only practicable proceeding is to take back the leased property.

There is no duty, legal or moral, on the part of the stockholders of the insolvent lessee, to provide money to pay the future rent of the lessor corporation. In the wreck they have lost the money which they paid in as an investment for their stock, as the lessor has lost its hope of receiving cash for future rents. Of course, so far as the property of the corporation can be turned into money from a sale, the creditors will avail themselves of it, and if it can be made to bring more than enough to pay creditors, a lessor railroad corporation, if it should leave its railroad under the lease, might avail itself of the money when it should afterwards sue for future rent.

Considering all the greatly increased expenditure in many directions that the public interest will call for, and the many millions that must be spent under the special provisions of this plan, it seems to me that as against the common stockholders, the fixed charges will be so enormously increased that they will have no reasonable expectation of ever receiving dividends on their stock.

It seems to me that in the negotiations which have led up to the presentation of this plan, the interests of the leased lines, and of the bankers, and of the holders of notes of the Hampden Railroad Company have been dominant, to the great sacrifice of the interests of the stockholders whom I represent.

From my point of view, when the railroad company is insolvent and cannot go on without a reorganization, and when lessor corporations and stockholders of the insolvent corporation come together to make a new arrangement that shall bring them relief, and when each party ought to consider fairly the interests of the other, and when I represent primarily the interests of the stockholders of the Boston & Maine, and indirectly the interests of small stockholders, as well as large, in the New York, New Haven & Hartford under an appointment from the court, it would be wrong for me voluntarily to agree to a reorganization which will give the leased lines their present income, and require a contribution from the stockholders of the Boston & Maine, and leave them nothing but stock which would be likely to bring no dividends.

If I am greatly in error in regard to the probable future earnings of the company, and if these earnings will be enough to pay the leased lines preferred dividends to the amount of their present rents, and to give dividends to the present stockholders notwithstanding all the extraordinary prior payments called for by this plan. We yet have to reflect that these dividends would be still larger if there could be relief from the onerous provisions of the leases, now proposed to be perpetuated in the new organization.

EDGAR E. CALVIN

Edgar E. Calvin, who on May 31 was elected president of the Union Pacific system, is another illustration of the rule that railway presidents rise from the ranks. He is one of that numerous school of railway executive officers who entered the service as telegraph operators. George Ade, who is an Indiana man himself, said once upon a time that all great men come from Indiana, and that the greater they are the faster they came. Mr. Calvin is no exception to this rule either, for he was born in Indianapolis; did his first railway work in Indiana, and went west as an operator on the Union Pacific when he was 24 years old.

No head of a western railway system has had a better experience for equipping himself for managing a western railway, or is better known in the west, than Mr. Calvin. He has been an officer of the Union Pacific, the Missouri Pacific, the International & Great Northern, the Oregon Short Line, the Oregon-Washington Railroad & Navigation Company, the San Pedro, Los Angeles & Salt Lake and the Southern Pacific. In fact he has been connected with railways west of the Mississippi river ever since he went to the Union Pacific as a telegraph operator.

The Union Pacific system is composed of the Union Pacific, the Oregon Short Line and the Oregon-Washington Railroad & Navigation Company, and it controls a half-interest in the Salt Lake Route. It will be noted that Mr. Calvin has, during his railroad career, been an officer of each of these individual properties. He is a very modest man and one of few words. In fact, he is as famous where he is known for being a man of few words as was Moltke, of whom it was said that he could keep silence in seven different languages. That a man who has filled all the positions he has on the railways which

formerly composed the Harriman system and who is now promoted to the presidency of the Union Pacific, is a very able operating officer goes without saying. He was one of the principal operating men on the Harriman lines during the period when, under E. H. Harriman's direction, they were undergoing that remarkable series of improvements which raised them to a position among the best properties physically and in point of the service rendered by them in the United States; and he played an important part in carrying out Mr. Harriman's plans. In other words, while he is a man who does not say much, he is one who does things. Besides being an able railway executive, he is widely known and very popular throughout the territory where he has worked so long.

It was expected a few years ago that the Central Pacific, by a decree of the Federal Courts, would be taken from the Southern Pacific and turned over to the Union Pacific. The understanding at that time was that if this were done a separate headquarters for the Central Pacific would be established at San Francisco, and that Mr. Calvin was slated to be elected president of it. Mr. Calvin is a popular railroad man in the west not only because he is genial and accessible personally, but because he believes in the railways

giving the public good service, taking it into their confidence and keeping out of politics, except by presenting their case by public statements and discussions. He was one of the first prominent railway officers in the country to take a stand for this policy.

Edgar E. Calvin was born on October 16, 1858, in Indianapolis, Ind. He began railroad work in 1873 as telegraph operator on the Indianapolis, Cincinnati & Lafayette, now part of the Cleveland, Cincinnati, Chicago & St. Louis. He thus began work at 15, but went to school during 1876. In April, 1877, he got the job of telegraph operator and station agent on the Union Pacific. In April, 1882, he became a conductor, later was made train despatcher and then trainmaster. On June 1, 1887, he was appointed superintendent on the Missouri Pacific. He returned to the Union Pacific in 1891, as superintendent of the Idaho division. In 1895 he was made general superintendent of the International & Great Northern. Two years later he was made general superintendent of the Oregon Short Line, and in 1903 was promoted to assistant general

manager. The following year he was made vice-president and general manager of the Oregon Railroad & Navigation Company, and in 1905, vice-president and general manager of the Southern Pacific. In 1912 he was elected vice-president of the Southern Pacific in general charge of operation and construction, with office at San Francisco. In January, 1914, Mr. Calvin was appointed vice-president and general manager of the Oregon Short Line with office at Salt Lake City, Utah. In November, 1915, he was elected also first vice-president of the San Pedro, Los Angeles & Salt Lake, and continued to make his headquarters at Salt Lake City.



Edgar E. Calvin

URAL-WHITE SEA RAILWAY.—A special conference in the Russian Ministry of Ways of Communication recently examined and approved a project for the construction of a private railway to serve the extensive timber areas of northern Russia and the mining industry of the northern Urals. The new line will begin at Archangel, proceed to Pinega, and, crossing the Urals, will extend along northern Siberia to the settlement of Chenshevsky on the Ob. It is proposed to lay a line from the Ural chain to Nadezhdinsk factory of the Bogoslovsk Company of Perm Government, in which section the new line will cross the Bogoslovsk Railway. Its length will be 1,007 miles, and the cost of construction is estimated at 100,320,000 rubles, (\$51,665,000 at the normal exchange rate of \$0.515 to the ruble). Owing to the topographical conditions in the localities to be traversed, many technical difficulties will have to be surmounted.

ELECTRIFICATION IN ITALY.—The Central Umbrian Railway, now being provisionally operated by steam traction, will be equipped with electric power next year. From Papigno three-phase current will be supplied to Marsciano transforming station for conversion to single-phase current. The electric locomotives used will be driven by four single-phase motors geared to the axles, each motor being 90 h. p.

General News Department

Telegraph operators and station agents of the Duluth, South Shore & Atlantic have been granted an increase in pay, averaging more than 10 per cent, effective June 1.

The Boston & Albany has increased the pay of freight handlers in the freight houses at Boston, and it is said that hereafter a regular rule will be followed in making promotions of freight handlers to clerkships.

On May 26 a fire destroyed a coal chute and sand house of the Chicago, Rock Island & Pacific at Silvis, Ill. It also damaged three locomotives and burnt up 1,200 tons of coal and five freight cars. The total loss is estimated at \$35,000.

The triennial convention of the Brotherhood of Locomotive Enginemen and Firemen will open at Denver on June 5. Among the matters to be considered are a general revision of the constitution and the selection of permanent headquarters.

The Chicago & North Western has issued a new edition of the booklet entitled, "Forty Ways or More to California and the North Coast Country." It contains information and maps of value to those planning vacation trips through the West.

The operation of open-top observation cars through the Royal Gorge and the Black Canyon of the Gunnison in Colorado has been resumed for the summer by the Denver & Rio Grande. All trains passing through these points by daylight have these cars.

Samuel W. Van Dyne, former cashier of the Missouri Pacific local freight office in St. Louis, in whose accounts a shortage of \$76,000 is alleged to have been discovered, and Edward J. English, former assistant cashier under Van Dyne, were arrested on May 23. Van Dyne had been in the employ of the Missouri Pacific for 13 years.

Strikes of considerable magnitude have taken place at many or most of the freight piers of the Trunk Line Railroads in lower Manhattan, New York, during the past week; but there appears to have been no absolute blockade of traffic. There is no strong organization of laborers, but there seems to be a quite general movement to try to secure increases in pay at the present time because of the recent good fortune, in that line, of the men working on the neighboring piers of the coastwise steamship companies.

The Massachusetts legislature has voted to take no action on the report of the Public Service Commission of the state, presented several weeks ago, specifying a large number of railroad and trolley companies, and other concerns, subsidiary to the New York, New Haven & Hartford, which, it was recommended, should be made the subject of a legislative act requiring the parent company to dispose of the properties within a certain limited time. Chairman Howard Elliott, presenting the argument of the New Haven Road, had shown the legislators the impropriety and injustice of the arbitrary action proposed by the Public Service Commission.

The Pullman Company announces a profit-sharing plan for employees. The general provisions are as follows: Five thousand shares of stock will be sold at \$155 per share, about \$10 less than the current market value, on long time payment to employees and officers who have been with the company for more than one year. An employee receiving \$500 a year or less will be allowed to subscribe for one share; employees receiving from \$500 to \$1,000, two shares, and at a proportionate rate of increase up to 25 shares for the officer receiving \$12,000. Payments for subscriptions will be in monthly instalments of \$4 per share, the employee getting the dividends from the time of purchase, but paying interest at no more than 4 per cent on deferred payments.

The labor leaders have secured favorable action by the House Committee at Washington on a bill to make more stringent the hours-of-labor law as affecting signalmen, and to bring within its provisions signalmen at interlocking towers even where they

do not send or receive train orders; and the bill is now on the House calendar awaiting action. The bill bears the name of Representative Cullop, of Indiana, and the House Committee has made a favorable report on it. In night-and-day offices the working time-limit is changed from 9 hours to 8 days, and the 8-hour term must be one continuous period. On the completion of the eight-hour period the employee must not be required or permitted to go on duty again until the expiration of 16 hours. The provision taking in levermen, which is effective only in cabins, stations, etc., which are operated continuously, applies to men who operate "signals or switches or similar mechanical devices controlling, pertaining to, or affecting the movement of trains." Exception is made in the case of accidents, etc., where the telephone must be used to obtain orders, and the law does not apply to railroads where there are not more than two passenger trains daily. On such roads of light traffic, signalmen may work 10 hours in each 24-hour period.

New York Merchants for Newlands Resolution

The Merchants' Association of New York, adopting a report of a special committee, favors the adoption by Congress of the resolution (No. 60), introduced by Senator Newlands, calling for a comprehensive congressional investigation of the whole subject of the federal regulation of carriers and of railroad transportation; and records its opposition to the Rayburn bill (H. R., 563), and other bills the subject matter of which is covered by the Newlands resolution. It is held that justice will not be promoted by the passage of laws dealing with but a single phase of the highly complex subject.

Chicago Freight Handlers Present New Demands

At a meeting of the executive committee of the Freight Handlers' Union in Chicago on May 28 it was decided to present to 22 railroads new wage schedules on behalf of about 6,000 freight handlers. The action provided for the presentation of the demands on May 29, with a threat to strike on June 1 if they were not acceded to. The new demands, according to John B. Roche, secretary of the union, are considerably lower than the schedules regarding which the railroad officers and labor heads have been conferring. Originally, he said, the men had asked a flat increase of 25 per cent in wages, and recognition of the union. The new set of demands includes an advance of three cents an hour for men employed by the hour, and \$10 a month for those paid monthly; time and one-half for overtime, double time on Sundays and holidays, and recognition of the union. Another meeting will be held this week.

Low Capitalization of American Railways

United States railways measure in length almost one-third more miles than the total for Europe, but cost almost 40 per cent less in capital, according to the annual compilation by the Bureau of Railway News & Statistics, Chicago. Setting the Bureau's summary of the latest European returns beside the Interstate Commerce Commission's figures for our own railways in 1914 gives the following:

	Europe	United States
Miles of line	198,554	235,815
Capital cost	\$25,059,644,889	\$15,719,696,925
Per mile of line.....	\$126,211	\$66,661

In the United States mileage, however, are included only railways with \$100,000 or more annual gross revenues. To it should be added 8,440 miles of the smaller roads, representing a capital cost of \$197,486,000, which the Bureau says raises the net capital of American railways to \$15,917,192,925, and reduces the capital per mile to \$65,166.

New capital for railway construction, extensions or improvements listed on the New York Stock Exchange in the calendar year 1915, the Bureau's analysis shows, aggregated only \$91,535,070, against \$303,230,500 the year before. In the same

time the total stocks and bonds listed rose almost $2\frac{1}{2}$ million dollars to \$693,482,770. In 1915, however, a far greater proportion of the total represented securities issued to refund or retire older issues. Bonds listed for purely new construction or improvement purposes fell from \$238,376,800 in 1914, to \$78,624,500 in 1915, while stocks listed for new purposes dropped from \$64,853,700 in 1914 to \$12,910,570 in 1915. In the same time bonds listed for refunding older issues, etc., rose from \$106,607,000 to \$247,030,600, and stocks from \$281,162,400 to \$354,917,100.

Begin Conferences on Wage Demands of Train Employees

Negotiations between the railways and the representatives of the organizations of train service employees that have presented demands upon the railways of the United States for higher wages were begun at a conference in the Engineering Societies' building, New York City, on Thursday of this week.

This is the first meeting of the two parties to the controversy to discuss the wage demands since they were presented to the railways individually on March 30, except for an informal conference at Chicago on April 27, when the time and place for conducting the negotiations was arranged.

The railways are represented by the National Conference Committee of the Railways, consisting of seven officers of Eastern railways, six officers of Western roads, and six officers of Southeastern lines, with Elisha Lee, assistant general manager of the Pennsylvania Railroad, as chairman.

The train employees are represented at the meeting by a committee consisting of a general chairman for each of the four brotherhoods, engineers, firemen, conductors and trainmen for each road that has contracts with the organizations, about 800 men in all. This employees' committee is led by the four chief officers of the four brotherhoods.

The demands of the men in brief are:

- I. Ten hours' pay for eight hours' or less service in all freight and yard service, thus increasing the hourly pay by 25 per cent.
- II. Overtime to be paid for at one and one-half times this new higher hourly rate, thus increasing the overtime pay by $87\frac{1}{2}$ per cent.

In submitting their proposition the organizations announced that they did not propose to discuss any other provisions of the present contracts except those specifically affected by their demands. The railroads, however, on receipt of the demands, immediately replied with a notice that they would insist on a frank discussion as to the rules and regulations interwoven in the present rate structure, and that there should be open for consideration any provisions in the schedule contracts affected by the proposals.

The railroads particularly desire to discuss such provisions in the schedules as are in conflict with the following principles:

- (a) No double compensation for the same time or service.
- (b) The same classifications for the purpose of compensation to be applied to all members of a train and engine crew.
- (c) Two or more differently paid classes of service performed in the same day or trip to be paid proportionate rates according to the class of service, with not less than a minimum day for the combined service.

Warning Posters for Automobilists on Long Island

The latest development in the Long Island Railroad's persistent campaign to prevent accidents at grade crossings is the issue-



ance of a series of posters, in five colors, vividly portraying the manner in which pedestrians, automobilists and drivers of horse-drawn vehicles, continue to invite fatal and serious injuries to

themselves by attempting to beat trains across the tracks. "Jail Might Stop Them—We Can't" is the title of one of them. An electric train and an automobile with five occupants are seen racing for a crossing. The second poster shows a crossing with gates down, a train not many feet away, and six persons making their way across the tracks, some crawling under the gates. A third shows a load of "joy riders" who have smashed through a gate and are on the track; and in a moment will be struck by an electric train. General Manager J. A. McCrea calls attention to the fact that the work of grade crossing elimination has never stopped on the Long Island road in the past fifteen years. Several hundred crossings have been wiped out at a cost of between \$15,000,000 and \$20,000,000, but the total abolition of grade crossings is necessarily several years off.

The first and the third of these posters are reproduced in



black and white herewith. The artist, Ernest Hamlin Baker, has treated his subjects with striking boldness, black, green and yellow being used to produce vivid contrasts. The railroad company, by a campaign of extraordinary vigor, succeeded last summer in keeping the crossing danger before the people of Long Island and New York City so constantly and with such emphasis that no wayfarer was killed at any of its crossings throughout the season; and evidently it is the purpose of the management to achieve equally good results this year.

Boiler Makers' Association Exhibitors

The following companies had exhibits at the Master Boiler Makers' Association convention, which met at the Hotel Hollenden, Cleveland, Ohio, last week:

- American Arch Company, New York—Security arch brick. Represented by Le Grand Parish, W. L. Allison, John P. Neff, H. D. Savage, J. T. Anthony, Geo. Wagstaff, R. J. Himmelright, M. K. Tate, T. F. Kilcoyne, T. Mahar, T. Ryan, Wm. Neale, A. W. Clokey and C. E. Miller.
- American Flexible Staybolt Company, Pittsburgh, Pa.—Flexible staybolts. Represented by C. A. Seley.
- Bird-Archer Company, New York—Boiler chemicals.
- Boiler Maker, The, New York—Copies of paper. Represented by Geo. Slate.
- Breakless Staybolt Company, Pittsburgh, Pa.—"Break-less" staybolts.
- Brubaker & Bros., W. L., Millersburgh, Pa.—Staybolt taps and reamers.
- Burden Sales Co., Troy, N. Y.—Staybolt iron and rivets.
- Carnegie Steel Co.
- Champion Rivet Company, Cleveland, Ohio—Rivets and Finnegan flexible resilient built-up flue ferrule.
- Chicago Pneumatic Tool Company, Chicago.—Pneumatic drills and hammers, and Boyer rivet buster.
- Cleveland Pneumatic Tool Company, Cleveland, Ohio—New pocket-in-head riveting hammer, chipping hammers, drills, etc. Represented by H. S. Coney, Arthur Scott, C. J. Alberts, C. D. Gainer, G. Gregory, E. M. Orrison, F. E. Schwarze, H. Orich and J. T. Graves.
- Cleveland Punch and Shear Works Company, Cleveland—Small tools for boiler shop and model of punch.
- Cleveland Steel Tool Company, Cleveland, Ohio—Punches and dies. Represented by A. F. Fothergill, R. J. Venning, V. D. Gilmore, B. F. Abel and H. W. Leighton.
- Dearborn Chemical Company, Chicago
- Draper Manufacturing Company, Port Huron, Mich.—Pneumatic flue welder.
- Faessler Manufacturing Company, J., Moberly, Mo.—Boiler shop tools.
- Flannery Bolt Company, Pittsburgh, Pa.—Represented by J. Rogers Flannery, B. E. D. Stafford, Geo. Howard, Wm. Wilson, Thos. Leahey and Chas. Hyland.
- Hilles & Jones Company, Wilmington, Del.—Boiler shop machinery. Represented by W. H. Connell and C. E. Thomas.
- Imperial Brass Manufacturing Company, Chicago—Oxy-acetylene welding and cutting tools. Represented by J. Schroeter.
- Ingersoll-Rand Company, New York—Pneumatic tools.
- Jacobs-Shupert U. S. Firebox Company, New York—Model of firebox.
- Lukens Iron and Steel Company, Coatsville, Pa.
- Mahr Manufacturing Company, Minneapolis, Minn.—Boiler shop torch and rivet forge. Represented by F. N. Brooker and H. H. Warner.

McCabe Manufacturing Company, Lawrence, Mass.—Photographs of Pneumatic flanging machines and samples of flanging.
 Monongahela Tube Company, Pittsburgh, Pa.
 Mudge & Company, Chicago—Mudge-Slater spark arrester. Represented by G. W. Bender.
 Otis Steel Company, Cleveland, Ohio—Tested specimens of flange and boiler steel and railway steel castings. Represented by D. W. Glanzer and Geo. E. Sevey.
 Oxweld Railway Service Company, Chicago—Oxy-acetylene welding and cutting equipment. Represented by W. L. Bean, C. M. Marshall, F. C. Hassel, P. F. Flood, M. S. Clarke, A. W. Whiteford, R. B. Alfante, J. C. Reid and Fred. Gardner.
 Parkesburg Iron Company, Parkesburg, Pa.—Boiler tubes.
 Pearsall Company, The, New York—Ideal tube expanders and cutters.
 Pierce Company, Wm. B., Buffalo, N. Y.—Dean boiler tube cleaners.
 Prest-O-Lite Company, Indianapolis, Ind.—Oxy-acetylene welding and cutting apparatus and portable lights.
 Rome Merchant Iron Company, Rome, N. Y.—Rome "Superior" staybolt iron.
 Simmons-Boardman Publishing Company, New York—Copies of *Railway Age Gazette* and *Railway Mechanical Engineer*. Represented by H. H. Marsh.
 Strong Kennard & Nutt Company, Cleveland, Ohio—"Adjustoglas" safety goggles. Represented by R. H. Cook.
 Tyler Company, W. S., Cleveland, Ohio—Draftac Spark arrester netting. Represented by L. D. Winters, J. H. Jackson, W. P. Cahall and H. C. Goss.
 Upton Nut Company, Cleveland, Ohio—Bolts and nuts.
 Vulcan Engineering Sales Company, Chicago—Photograph of 100-ton, 21-ft. riveter. Represented by Jas. T. Lee, A. F. Jensen, Donald Alexander and Otto F. Weiss.

Railway Signal Association

The proceedings of the first day of the May meeting of the Railway Signal Association, held in New York City, were reported in the *Railway Age Gazette* last week, page 1148. On the second day, Thursday, May 25, the discussions were on the reports of committees 3, 6, and 9. None of these reports elicited much discussion and the meeting adjourned at noon, although it had been expected to hold an afternoon session.

Committee No. 3, Power Interlocking, F. B. Wiegand, chairman, submitted revised specifications for petroleum asphaltum, and also presented, as information, eight drawings showing typical circuit plans for electro-pneumatic interlocking installations. These drawings have been discussed at former meetings. As corrected, they are now to be found in the *Journal* for March last, pages 85 to 92.

Committee No. 6, Standard Designs, F. P. Patenall, chairman, presented six standard drawings, three of them being revisions of previous issues. These included foundations for ground-mast mechanical signals; mechanical semaphore bearings; battery elevators; foundations for ground-mast bottom mechanism signals; three-cell elevator and sub-base for bottom-mast mechanism cases.

Committee No. 9, Wires and Cables, W. H. Elliott, chairman, reported that it would be inexpedient at the present time to prepare specifications for insulating compounds. The committee presented revisions of a number of the paragraphs in the specifications for friction tape and for rubber insulating tape.

The report of the special committee on Harmonizing of Specifications, H. S. Balliet, chairman, was briefly discussed. It made a number of recommendations looking to the use of uniform language in different codes of specifications.

The M. C. B. and M. M. Conventions

The following are the programs of the Master Car Builders' Association and the American Railway Master Mechanics' Association which meet at Atlantic City on June 14 and June 19, respectively.

MASTER CAR BUILDERS' CONVENTION

WEDNESDAY, JUNE 14, 1916

Morning Session—9:30 a. m. to 1:30 p. m.

Address by the president	9:30 a. m. to 10:30 a. m.
Reading of the minutes of the last meeting	10:30 a. m. to 10:35 a. m.
Report of secretary and treasurer	10:35 a. m. to 10:50 a. m.
Assessment and announcement of annual dues; appointment of committees on correspondence, resolutions, obituaries, etc.	10:50 a. m. to 11:00 a. m.
Election of auditing committee	11:00 a. m. to 11:05 a. m.
Unfinished business	11:05 a. m. to 11:10 a. m.
New business	11:10 a. m. to 11:20 a. m.
Discussion of reports on:	
Nominations	11:20 a. m. to 11:30 a. m.
Standards and recommended practice	11:30 a. m. to 12:00 m.
Train brake and signal equipment	12:00 m. to 12:30 p. m.
Brake shoe and brake beam equipment	12:30 p. m. to 1:00 p. m.
Car wheels	1:00 p. m. to 1:30 p. m.

Afternoon Session—3 p. m.

The executive committee decided that it would be best to have a session devoted exclusively to a discussion of the revision of the rules of interchange and that it form a part of the proceedings.

At this session the following reports of committees will be considered:

1. Arbitration committee.
2. Revision of prices for labor and material.
3. Settlement prices for reinforced wooden cars.

THURSDAY, JUNE 15, 1916

9:30 a. m. to 1:30 p. m.

Discussion of reports on:

Couplers	9:30 a. m. to 10:30 a. m.
Draft gear	10:30 a. m. to 11:00 a. m.
Safety appliances	11:00 a. m. to 11:15 a. m.
Loading rules	11:15 a. m. to 11:45 a. m.
Car construction	11:45 a. m. to 12:15 p. m.
Car trucks	12:15 p. m. to 12:45 p. m.
Train lighting and equipment	12:45 p. m. to 1:30 p. m.

FRIDAY, JUNE 16, 1916

9:30 a. m. to 1:30 p. m.

Discussion of reports on:

Tank cars	9:30 a. m. to 10:00 a. m.
Specifications and tests for materials	10:00 a. m. to 11:00 a. m.
Welding of truck sides and bolsters	11:00 a. m. to 11:30 a. m.

Unfinished business; reports of committees on correspondence, resolutions, and such other committees as may be named during the convention

Election of officers

MASTER MECHANICS' CONVENTION

MONDAY, JUNE 19, 1916

9:30 a. m. to 1:30 p. m.

Prayer	9:30 a. m. to 9:35 a. m.
Address of president	9:35 a. m. to 9:50 a. m.
Intermission (to allow those who wish to retire to do so, although all are requested to remain)	9:50 a. m. to 9:55 a. m.
Action on minutes of convention of 1915	9:55 a. m. to 10:00 a. m.
Reports of secretary and treasurer	10:00 a. m. to 10:15 a. m.
Assessment and announcement of dues; appointment of committees on correspondence, resolutions, nominations, obituaries, etc.	10:15 a. m. to 10:25 a. m.
Election of auditing committee	10:25 a. m. to 10:30 a. m.
Unfinished business	10:30 a. m. to 10:35 a. m.
New business	10:35 a. m. to 10:45 a. m.
Discussion of reports on:	
Mechanical stokers	10:45 a. m. to 11:00 a. m.
Revision of standards	11:00 a. m. to 11:30 a. m.
Dimensions of flange and screw couplings for injectors	11:30 a. m. to 12:00 m.
Individual paper:	
Standardization of screw threads, by F. O. Wells	12:00 m. to 12:30 p. m.
Topical discussion:	
Metallic packing for superheater locomotives, Best material for (to be opened by W. E. Woodhouse, C.M.E., Canadian Pacific)	12:30 p. m. to 1:00 p. m.
Discussion of report on:	
Fuel economy and smoke prevention	1:00 p. m. to 1:30 p. m.

TUESDAY, JUNE 20, 1916

9:30 a. m. to 1:30 p. m.

Discussion of reports on:	
Locomotive headlights	9:30 a. m. to 9:45 a. m.
Design, construction and maintenance of locomotive boilers	9:45 a. m. to 10:15 a. m.
Superheater locomotives	10:15 a. m. to 10:30 a. m.
Equalization of long locomotives	10:30 a. m. to 11:00 a. m.
Design, maintenance and operation of electric rolling stock	11:00 a. m. to 11:15 a. m.
Best design and materials for pistons, valves, rings and bushings	11:15 a. m. to 11:30 a. m.
Co-operation with other railway mechanical organizations	11:30 a. m. to 12:00 m.
Individual paper:	
Alloy steels, by L. R. Pomeroy	12:00 m. to 1:00 p. m.
Topical discussion:	
Instructions to young firemen; number of men to each instructor; recommended status of instructors (to be opened by W. H. Corbett)	1:00 p. m. to 1:15 p. m.
Subjects	1:15 p. m. to 1:30 p. m.

WEDNESDAY, JUNE 21, 1916

9:30 a. m. to 1:30 p. m.

Discussion of reports on:	
Powdered fuel	9:30 a. m. to 10:00 a. m.
Specifications and tests for materials	10:00 a. m. to 10:30 a. m.
Modernizing of existing locomotives	10:30 a. m. to 11:00 a. m.
Train resistance and tonnage rating	11:00 a. m. to 11:30 a. m.
Subjects	11:30 a. m. to 11:45 a. m.
Individual paper on:	
Tests of four types of passenger car radiators, by Prof. A. J. Wood	11:45 a. m. to 12:15 p. m.
Topical discussion:	
Best method of introducing oil to cylinders of superheater locomotives (to be opened by Jos. Chidley)	12:15 p. m. to 12:30 p. m.
Resolutions, correspondence, etc.	12:30 p. m. to 12:45 p. m.
Unfinished business	12:45 p. m. to 1:00 p. m.
Election of officers, closing exercises	1:00 p. m. to 1:30 p. m.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings and places of meeting.

- AIR BRAKE ASSOCIATION.**—F. M. Nellis, Room 3014, 165 Broadway, New York City.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.**—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, June 26, 1916, Boston, Mass.
- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.**—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, 1916, New Orleans, La.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.**—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June 20-23, 1916, Cincinnati, O.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.**—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.**—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.**—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.**—H. G. McConaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.
- AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.**—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.
- AMERICAN RAILWAY ASSOCIATION.**—J. F. Fairbanks, general secretary, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.**—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.**—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.**—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June 19-21, 1916, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.**—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.
- AMERICAN SOCIETY FOR TESTING MATERIALS.**—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Annual meeting, June 27-30, Hotel Traymore, Atlantic City, N. J.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.**—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.**—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.**—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.**—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, June 28, 1916, Hotel Statler, Detroit, Mich.
- ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.**—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October 10, 1916, Waldorf-Astoria, New York.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.**—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.**—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Semi-annual meeting, June 16, 1916, Hotel Denis, Atlantic City, N. J.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.**—P. W. Drew, Soo Line, 112 West Adams St., Chicago. Annual meeting, June 20-22, 1916, St. Paul, Minn.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.**—G. P. Conard, 75 Church St., New York. Next meeting, June 27, 28, Boston, Mass.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.**—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.**—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.**—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.**—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.**—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CINCINNATI RAILWAY CLUB.**—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.**—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.**—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.**—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.**—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.**—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.**—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

- MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.**—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.
- MASTER BOILER MAKERS' ASSOCIATION.**—Harry D. Vought, 95 Liberty St., New York.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.**—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September, 12-14, 1916, "The Breakers," Atlantic City, N. J.
- MASTER CAR BUILDERS' ASSOCIATION.**—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June 14, 1916, Atlantic City, N. J.
- NATIONAL RAILWAY APPLIANCE ASSOCIATION.**—C. W. Kelly, 349 People's Gas Bldg., Chicago. Next convention, March, 1917, Chicago.
- NEW ENGLAND RAILROAD CLUB.**—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.**—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.**—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.**—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.**—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY BUSINESS ASSOCIATION.**—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, New York.
- RAILWAY CLUB OF PITTSBURGH.**—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.
- RAILWAY DEVELOPMENT ASSOCIATION.**—H. O. Hartzell, B. & O. R. R., Baltimore, Md.
- RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.**—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.
- RAILWAY FIRE PROTECTION ASSOCIATION.**—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.
- RAILWAY REAL ESTATE ASSOCIATION.**—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.
- RAILWAY SIGNAL ASSOCIATION.**—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Semi-annual meeting, May 24-25, 1916, Hotel Astor, New York. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.
- RAILWAY STOREKEEPERS' ASSOCIATION.**—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.
- RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.**—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.
- RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.**—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.
- RICHMOND RAILROAD CLUB.**—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.**—L. C. Ryan, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.
- ST. LOUIS RAILWAY CLUB.**—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SALT LAKE TRANSPORTATION CLUB.**—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.
- SIGNAL APPLIANCE ASSOCIATION.**—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
- SOCIETY OF RAILWAY FINANCIAL OFFICERS.**—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.**—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.**—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.
- TOLEDO TRANSPORTATION CLUB.**—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.
- TRACK SUPPLY ASSOCIATION.**—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.
- TRAFFIC CLUB OF CHICAGO.**—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEWARK.**—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.
- TRAFFIC CLUB OF NEW YORK.**—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.**—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.
- TRAFFIC CLUB OF ST. LOUIS.**—W. S. Crilly, 620 South 7th St., St. Louis, Mo. Annual meeting, December 5, 1916. Noonday meetings, October to May.
- TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.**—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 20, 1916, Toronto, Ont.
- TRANSPORTATION CLUB OF DETROIT.**—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.
- TRAVELING ENGINEERS' ASSOCIATION.**—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.
- UTAH SOCIETY OF ENGINEERS.**—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.**—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.**—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.
- WESTERN SOCIETY OF ENGINEERS.**—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Long Island Railroad has notified the New York State Public Service Commission, second district, that it desires to increase the price of thousand mile tickets from 2 cents a mile to 2½ cents.

Terminal regulations in Chicago will be investigated by the Interstate Commerce Commission. Certain tariffs filed by the carriers naming new individual and joint regulations and practices have been suspended until September 22.

The Trunk Lines announce that on a large number of commodities classed under the head of iron and steel, including all of the coarser kinds, an advance in freight rates will be made October 1, on shipments from Pittsburgh to the Atlantic Seaboard for export. The advances will be about 50 per cent, bringing these rates up to the basis of those charged for the same articles when destined to domestic points. On pig iron in carloads now charged at the rate of \$1.74 per ton the new rate will be \$2.58. These low rates on goods for export have been in force about 13 years. The newspapers report the steel manufacturers as approving the proposed increase. One of them says that it will have no more effect on European business than a gentle rain would have on the Atlantic Ocean.

The Southern Railway and its three principal subsidiaries—the Cincinnati, New Orleans & Texas Pacific, the Mobile & Ohio and the Alabama Great Southern—are combining their efforts toward the development of South American trade. For this purpose there is published semi-monthly a pamphlet entitled "Latin-American Opportunities for the South," in which are included statistical trade data and other general information for use in the expansion of commerce in the southern hemisphere. There are also included lists of specific trade opportunities in 20 South American republics for the sale of articles made in the territory traversed by these roads. C. L. Chapman, formerly of the United States consular service, is in charge, with office at Chattanooga, Tenn.

A. H. Smith, president of the New York Central and chairman of the Eastern Freight Accumulation Conference announces that the conference has been dissolved. It has been in session a large share of the time for the past two months. The labors of the conference, and of the committees of railroad officers working under it, in ameliorating the conditions of embargoes and removing obstacles to the free movement of freight, especially in and around New York City and on the lines in New England, have been markedly successful. The co-operation between officers of the railroads, shippers and receivers of freight, and the representatives of the Interstate Commerce Commission and state commissions has been more businesslike and successful than on any former occasion. Mr. Smith has issued a letter thanking the public officers, shippers, boards of trade, etc., for their helpful co-operation; and special thanks are accorded Commissioner E. E. Clark who, on behalf of the Interstate Commerce Commission, has worked with the conference throughout.

The New York, New Haven & Hartford announces the relaxation of most of its freight embargoes and the complete lifting of many of them; but at the same time unsatisfactory conditions exist at many places and a circular has been sent to shippers, consignees and boards of trade calling for continued co-operation with the road and for careful attention to the measures that are needed to remove friction. Shippers of freight are asked to ship at a uniform rate per day or per week and no faster than the goods can be unloaded; to notify the company if freight is not promptly handled at the company's stations; to take freight away from freight houses without delay; to clear up the cars on each track each day where practicable, so that each day's switching shall be simplified as much as possible; to get a supply of coal now for next winter; to call on the railroad for assistance and counsel in enlarging facilities; to influence other shippers and consignees, and to refrain from trying to correct inequalities in freight movement except in co-operation with the railroad companies. The engineering department, as well as other departments of the road, will aid industries in improving facilities where practicable.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Coal from Oak Hills, Colo.

Hayden Brothers Coal Corporation et al. v. Denver & Salt Lake et al. Opinion by Commissioner Daniels:

Upon complaint of coal companies owning and operating coal mines, all within six miles of Oak Hills, Routt county, Colo., on the Denver & Salt Lake, the commission orders the establishment of through routes and joint rates on soft coal in carloads from Oak Hills, Colo., and points taking the same rates, to stations in Kansas, Nebraska, Missouri, Iowa and South Dakota, on the Atchison, Topeka & Santa Fe, the Missouri Pacific, the Chicago & North Western, and the Chicago, St. Paul, Minneapolis & Omaha. Section 15 of the act precludes the establishment of through routes and joint rates via the Union Pacific from Oak Hills to stations on the Missouri Pacific in Kansas south of Kanopolis, Kan. (39 I. C. C., 94.)

Rates on Brewers' Rice

Mutual Rice Trade and Development Association v. International & Great Northern et al. Opinion by Commissioner Harlan:

Carload rates on domestic brewers' rice from Houston, Tex., to various points in central freight association territory and to points in Illinois, which are certain differentials over the rates on domestic brewers' rice from New Orleans, La., to the same points, are not found prejudicial to Houston.

Where rates on imported brewers' rice from Galveston, Tex., to Chicago, Indianapolis, Ind., or other interior points, are more than 6 cents lower than rates on imported brewers' rice from New York to the same points, it is held to be discriminatory to charge higher rates on domestic than on import shipments from Galveston or Houston.

An increase of 5 cents per 100 lb. in the rate on clean rice from Houston to north Pacific coast points, effective February 1, 1914, is found justified. (39 I. C. C., 149.)

Rates on Soft Coal from the Black Mountain District

Black Mountain Corporation v. Louisville & Nashville et al. Opinion by Commissioner Harlan:

The combination rate of \$1.95 per net ton on bituminous coal from the Black Mountain district in Virginia to Atlanta, Ga., applicable by way of the Louisville & Nashville and Southern Railway through Cumberland Gap, Tenn., is found to be unreasonable. The Louisville & Nashville is therefore required to establish a rate for the future not to exceed \$1.70 per net ton to apply over its own rails through Corbin, Ky., or in connection with the Southern Railway through Cumberland Gap.

The combination rate of \$1.74 per gross ton on bituminous coal from the Black Mountain district to Norfolk, Va., for delivery to vessels destined to points outside the capes of Virginia, is found to be discriminatory to the extent that it exceeds the rate from Norton, Va., to Norfolk, applicable on like traffic, by more than 20 cents per gross ton. (39 I. C. C., 153.)

STATE COMMISSIONS

The Maryland Public Service Commission has approved an agreement between the Pennsylvania and the Western Maryland railroads, on the one part, and the Chesapeake & Curtis Bay, on the other part, for the use of the tracks of the last-named road by the locomotives of the other two companies, for freight transportation. The tracks of the Chesapeake & Curtis Bay furnish access to important industrial plants on the south side of the bay at Baltimore, and it is understood that the two larger roads will make connection with these tracks by means of floats across the bay.

UNITED STATES SUPREME COURT

State Laws and Federal Employers' Liability Act

The Supreme Court of the United States holds that the fact that an action in a state court is brought under the federal employers' liability act does not prevent the state court from enforcing the statute law of the state, as to a less than unanimous verdict or as to the number of the jury. This decision controls cases recently decided in Minnesota, Virginia, Kentucky and Oklahoma.—*Minneapolis & St. Louis v. Bombolis*. Decided May 22, 1916.

Federal Jurisdiction of Railroad Suits

The Supreme Court of the United States holds that the federal district court has no jurisdiction over a suit to foreclose a railroad mortgage merely because the railroad is incorporated under congressional laws. Section 5 of the act of January 28, 1915, amending the Judicial Code, declares that "no court of the United States shall have jurisdiction of any action or suit by or against any railroad company upon the ground that said railroad company was incorporated under an act of Congress." This must be taken as requiring that a suit by or against a railroad company incorporated under an act of Congress be not regarded, for jurisdictional purposes, as arising under the laws of the United States, unless there be some adequate ground for so regarding it other than that the company was thus incorporated.—*Bankers' Trust Co. v. Texas & Pacific*. Decided May 22, 1916.

Flagman Asleep on Track

A freight train having stalled, the engineman directed a brakeman to flag an approaching passenger train. The brakeman's duty was to go forward 18 telegraph poles with a red and a white lantern in hand, and lay a torpedo on the track; then to go 9 poles further and place two torpedoes; then to return, stand near pole 18 and await the expected train. It was then 20 minutes before sunrise and somewhat foggy. No torpedo was put in place; but, having advanced some three-quarters of a mile, the brakeman set the lanterns on the track, laid his head on a crosstie and went to sleep. He was struck and killed by the passenger train. In an action under the federal employers' liability act for his death, it appeared that the point where the passenger engineman could first have seen the deceased was 1,254 feet away; and he testified that on seeing the lights he sounded a signal acknowledging the flagman's signal; almost immediately after, seeing the brakeman, he put on brakes, shut off steam and did everything possible to check the train; but too late; and a low step struck the brakeman's head. Evidence was given that the train, composed of six steel sleepers and four other cars, which was running down a long incline at 55 miles an hour, could not have been stopped in less than 1,900 feet. Reversing a decision for the plaintiff of the Supreme Court of North Carolina, the Supreme Court of the United States holds that there was no evidence that the engineman could have seen the brakeman a single moment before he did, or that thereafter he omitted to do all in his power to save him, and that a motion to dismiss should have been granted.—*Southern v. Gray*. Decided May 22, 1916.

Two Cases of Assumption of Risk Under Federal Employers' Liability Act

After two trials in the Virginia courts, in the first of which a judgment for \$12,000 was reversed by the Virginia Supreme Court of Appeals, and in the second a judgment for the defendant was affirmed, the Supreme Court of the United States, affirming that judgment, holds that a fireman of an engine, who knew of the custom of depositing cinders between the tracks, knew of their existence, and who attempted to mount a moving engine with a water cooler in his hands holding about a gallon, could not be considered as not having appreciated the danger and assumed the risk of the situation because he had forgotten their existence at the time and did not notice them; and that he could not recover for injuries sustained by stumbling over the pile and being drawn over the locomotive. The action was brought under the federal employers' liability act, under which the defense of assumption of risk is abolished only where the

negligence of the carrier is in violation of some statute enacted for the safety of employees.—*Jacobs v. Southern*. Decided May 22, 1916.

The Supreme Court of the United States holds that whether a brakeman, who was required by his duty to board a moving engine from a platform, assumed the risk of boarding it when it was running about 12 miles an hour, was a question for the jury. It could not be said as a matter of law, conceding he had a right to assume the engineman would run the train slowly enough to enable him to get on in safety, that a train running at that speed came to him so suddenly and unexpectedly that he did not have an opportunity to realize and appreciate the danger of getting on. For failure to so submit the question, judgment of the Kentucky Court of Appeals for the plaintiff was reversed in an action under the federal employers' liability act for injuries received by the brakeman's falling beneath the wheels when his foot slipped after he had caught hold of the grab iron and had put one foot on the step.—*C. & O. v. De Atley*. Decided May 22, 1916.

Limitation of Carrier's Liability and Alternate Rates

The Supreme Court of the United States has reversed a judgment of the Supreme Court of Tennessee holding void a limitation of liability in a bill of lading of an interstate shipment, according to the railroad's published alternate freight rates, on "Horses or Mules, not exceeding \$75 each." The essential facts of the case and the grounds of the decision sufficiently appear from the following extracts from the opinion, delivered by Mr. Justice McReynolds:

"We cannot assent to the theory, apparently adopted below, that the interpretation and effect of a bill of lading issued by a railroad in connection with an interstate shipment present no federal question unless there is affirmative proof showing actual compliance with the interstate commerce act. It cannot be assumed, merely because the contrary has not been established by proof, that an interstate carrier is conducting its affairs in violation of law. Such a carrier must comply with strict requirements of the federal statute or become subject to heavy penalties, and in respect of transactions in the ordinary course of business it is entitled to the presumption of right conduct. The law 'presumes that every man, in his private and official character, does his duty until the contrary is proved.'

"Under our former opinions the settled doctrine is that where alternate rates, fairly based upon valuation are offered, a railroad may limit its liability by special contract.

"The essential choice of rates must be made to appear before a carrier can successfully claim the benefit of such a limitation and relief from full liability. And as no interstate rates are lawful unless duly filed with the commission, it may become necessary for the carrier to prove its schedules in order to make out the requisite choice. But where a bill of lading, signed by both parties, recites that lawful alternate rates based on specified values were offered, such recitals constitute admissions by the shipper and sufficient prima facie evidence of choice. If in such a case the shipper wishes to contradict his own admissions, the burden of proof is upon him.

"The bill of lading in question is plainly entitled: 'Contract for Limited Liability in the Transportation of Live Stock at Reduced Rates,' and contains the conspicuous provisions concerning published rates, tariff regulations, choice offered the shipper and limit upon the carrier's liability, etc., above set out. In view of these recitals and admissions, the limitation of liability must be treated as prima facie valid, and consequently, the trial court erred in holding it void as a matter of law and permitting a recovery for full value of the animals."

The shipment consisted of a carload of mules killed and injured in a wreck, for which the state court had given judgment for \$220 per head. The bill of lading's clause limiting liability stated "The published freight rates on live stock of said carrier are, in all cases, based on the following maximum calculations, which are as high as the profit in the freight rates will admit of the carrier assuming responsibility for: . . . Horses or Mules, not exceeding \$75 each . . ."; that the carrier's tariff regulations provided that for every increase of 100 per cent or fraction thereof, in these valuations, there should be an increase of 50 per cent in the freight rate; and that the shipper agreed to the limitation of liability, "unless an additional amount

is herein stated and paid for."—Cincinnati, N. O. & T. P. v. Rankin. Decided May 22, 1916.

COURT NEWS

Taxation—"Doing Business" in the State

Section 182 of the New York Tax Law imposes a tax on every corporation doing business in the state for the privilege of doing business or exercising its corporate franchises. The New York Court of Appeals holds that a railroad company, formed to take over the properties of another road, which leased these properties to a third, and did not operate them itself, but merely kept its corporate existence alive, as required by the lease to the third road, to preserve its franchises, was not liable to the tax, as it was not "doing business" in the state.—People ex rel. Lehigh & New York (N. Y.), 112 N. E., 181.

Free Passes—Riding Without Ticket

The Supreme Court of Texas holds that the statute making it an offense to use free passes does not make it an offense merely to board a train, and seek to ride without paying fare, without attempting to use some kind of token of the right to be transported, and a person trying to get free transportation for a child under the false pretence that it was under age would not be liable in the penalty.—Carpenter v. Trinity & Brazos Valley (Tex.), 184 S.W., 186.

Agreements for Attorneys' Contingent Fees

A woman injured while a passenger employed attorneys to represent her in collecting damages, and agreed that they should receive half the sum collected after deducting necessary costs of collection, and that she would not compromise or settle the claim without authority from the attorneys. After a claim for \$1,000 had been lodged, the railroad claim agent, with knowledge of the attorneys' rights, procured a release from the injured party by paying her \$100 and agreeing to pay a doctor's bill of \$22.50 and to settle with the attorneys. The attorneys sued the railroad for \$1,000, of which their share should be \$500, or failing that, that \$122.50 should be paid to them. The trial court refused an instruction requested by the railroad directing a verdict for the plaintiffs for \$61.25, and gave a peremptory instruction for the plaintiff for \$122.50. This was at first affirmed on appeal by the Court of Civil Appeals of Texas, but on a rehearing it was held that the plaintiffs were only entitled to receive \$61.25, and that the trial court erred in refusing the requested instruction.—Texas & New Orleans v. Marshall & Marshall (Tex.), 184 S. W., 643.

Liability for Balance of Freight Charges

The Nebraska Supreme Court holds that the mere acceptance from a carrier and removal of a shipment by one who is not the consignee named in the bill of lading does not of itself create a primary obligation on the part of the one receiving the goods to pay charges beyond the amount stated and claimed by the carrier at the time of such acceptance and removal. In such a case, where the failure by the carrier to collect the full amount of the freight charges, as fixed by the legal tariffs is the fault of the carrier, it must first look to the consignor with whom it contracted to make the shipment, and who, in this case, was also the consignee named in the bill of lading, for any balance due thereon. It was probable that the recipient of the goods would be secondarily liable for the balance, but before proceeding against him, the railroad must first exhaust its remedy against the consignor and consignee.—Union Pacific v. W. L. Stickel Lumber Co. (Nebr.) 156 N. W. 1082.

Railroad Cannot be Garnished While Interstate Shipment is in Transit

May a railroad engaged in interstate commerce, having in its possession goods to be delivered to the consignor or upon his order, be garnished while the goods are in actual transit, the goods being still within the state, although in another county at the time the notice of garnishment is served? The Iowa Supreme Court answers this question in the negative, and holds the railroad so garnished not liable for the value of the property garnished though it carried it to its destination and delivered it to the consignor. The railroad was bound to receive all goods tendered to it for

shipment, to transport them without delay and deliver them to the consignee. It was engaged in a semipublic business, and it could not have been intended that the business of railroads engaged in interstate commerce should be thus interfered with. The questions were not decided as to whether the railroad might be garnished if the goods were not in transit, or if the shipment were intrastate in character.—Dart Mfg. Co. v. Rock Island (Iowa) 156 N. W. 714.

"Adequate Crossing" on Farm—Grade and Undercrossings

In an action of mandamus by a landowner to compel a railroad company whose line ran through his land to construct an undercrossing in place of the existing grade crossing, the railroad claimed that at no place could a crossing of any character be constructed at right angles or obliquely across the right of way without making a grade of more than 30 per cent, and so steep that it could not be in any manner traveled; and that to construct an undercrossing where the plaintiff wanted it, even at an unreasonable grade, would cost more than \$8,000. The Iowa Supreme Court holds that, on the question whether a grade crossing, with proper gates and guards, is adequate, the question of cost is not a defense, but is a circumstance properly to be considered with the other facts in the case, and neither the expense nor the convenience or profit to the landowner taken alone is necessarily ground for making or refusing an order for an undercrossing. The rule in the state of Iowa is for a grade crossing, and it is only when this is unreasonable and inadequate that any other may be required. A landowner is entitled, not to the most convenient or profitable means of crossing, but to an "adequate crossing," the location and character of which must be determined with a due regard for all the interests involved in its construction and maintenance, such as the reasonable use which the owner desires to make of the land, the expense of the crossing, and its effect on the operation of the railroad, and the safety of life and property. The court refused to order an underground crossing, but ordered that the railroad move a gate at the existing grade crossing, and cut down an embankment so as to enable a person approaching the crossing from that direction to see approaching trains.—Klopp v. C. M. & St. P. (Iowa), 157 N. W., 230.

Relief Department Committee's Award Conclusive

A car inspector, a member of the voluntary relief department of the Pennsylvania Lines west of Pittsburgh, who had sustained a permanent injury, submitted the question as to whether or not he was incapacitated from his injury to earn a livelihood in an employment suited to his capacity and of his right to compensation first to the superintendent of the department and, on appeal, to the advisory committee, in accordance with the rules of the department. Ignoring the decisions of the superintendent and the advisory committee, which were against him, the member sued the railroad and the relief department under his contract as embodied in his certificate of membership. This is the second appeal of the case. In the first (152 Ky., 824) the action was dismissed on the ground that there was no proof that the decisions of the superintendent and the committee were made, as alleged, through fraud or mistake. The Kentucky Court of Appeals now holds that these decisions were conclusive and a bar to relief on the original claim till the award was impeached for fraud or mistake. If arbitrators only determine the questions submitted to them, and do not go beyond the terms of the submission, a mistake of judgment in their conclusions, whether as to the law or the facts, if their conclusions are honestly arrived at, is not ground for setting aside the decision. Even where arbitrators have admitted illegal evidence, it is not ground for impeaching their award, unless the decision was based on the improper evidence that but for it the decision would have been other than the one made. The evidence failed to show that the advisory committee were laboring under any mistake as to the actual facts of the case. It was only a question of fact it was called on to decide. While a court or other set of men might have arrived at a different conclusion from the facts submitted, there was no evidence of such a gross or palpable mistake in judgment as to be evidence of misconduct or partiality on the part of the members of the committee or any fraud on the part of the prevailing party which affected the committee's decision. It was held that the trial court did not err in directing a verdict for the defendants.—Reager's Adm. v. Pennsylvania Co. (Ky.), 184 S. W., 395.

Railway Officers

Executive, Financial, Legal and Accounting

Perry McCart, who has been appointed general solicitor of the Chicago, Indianapolis & Louisville, vice E. C. Field, deceased, as has already been announced in these columns, was



P. McCart

born near Orleans, Orange county, Ind., on November 5, 1864. He was educated in the public schools of Orange county, Orleans high school, the Southern Indiana Normal College at Mitchell, Ind., and in the law department of the University of Tennessee at Knoxville, Tenn. In 1897 he was a member of the house of representatives of the Indiana legislature. For a number of years he served as local attorney for the Chicago, Indianapolis & Louisville. In September, 1915, he came to Chicago as general attorney of the Monon. As general so-

licitor, he will continue to have headquarters at Chicago.

William P. Kappes, receiver of the Evansville & Indianapolis, on July 1, will also take over the office and will discharge the duties of treasurer, in place of W. F. C. Golt, resigned, with principal office at Indianapolis, Ind. E. L. Mitten, auditor, has been appointed also assistant treasurer, with office at Terre Haute, Ind., in place of Elza G. Neal, resigned, effective July 1.

Marvin Hughitt, Jr., who has been appointed vice-president in charge of operation and maintenance of the Chicago & North Western, vice R. H. Aishton, was born at Bloomington, Ill., on September 24, 1861.



M. Hughitt, Jr.

He entered railway service in 1881, in the general freight department of the North Western. From February 1, 1887, to January 1, 1893, he was division freight agent of the same railroad. From the latter date to October 1, 1896, he was assistant general freight agent, and from 1896, to February 1, 1900, he served as general freight agent. He was appointed freight traffic manager in February, 1900, and continued in that position until November 10, 1915, when he was promoted to general traffic manager.

As vice-president in charge of operation and maintenance, he will continue to have headquarters at Chicago.

F. C. Schumaker has been appointed auditor and car accountant of the Wellsville & Buffalo, and G. E. Joyce has been appointed treasurer. Both with offices at Buffalo, N. Y.

The election of Edgar E. Calvin, vice-president and general manager of the Oregon Short Line, also first vice-president of the San Pedro, Los Angeles & Salt Lake, as president of the Union Pacific, succeeding A. L. Mohler, resigned, is commented on elsewhere in this issue.

A. H. Plant, comptroller of Southern Railway, with headquarters at Washington, D. C., has been appointed controller also of the Cincinnati, New Orleans & Texas Pacific, and the Alabama Great Southern, vice M. F. Molloy, deceased.

Operating

H. D. Hathaway has been appointed trainmaster and chief despatcher of the Wellsville & Buffalo, with office at Blasdell, N. Y.

E. E. Lillie has been appointed superintendent of the Spokane & Inland Empire with office at Spokane, Wash., succeeding A. J. Davidson.

John M. Condon was appointed inspector of operation of the Erie, instead of assistant to general superintendent, with headquarters at Youngstown, Ohio, as reported in a recent issue.

R. W. D. Harris, trainmaster of the Canadian Pacific at Wilkie, Sask., who was recently transferred as trainmaster to Kenora, Ont., has now been appointed trainmaster at Fort William.

Taber Hamilton, whose appointment as superintendent of the Peoria division of the Vandalia has been announced, was born at Ft. Wayne, Ind., on July 8, 1876. He was educated at Yale



T. Hamilton

University (1894-1898), and at Purdue University (1898-1899). He entered railway service in June, 1898, as apprentice in the Ft. Wayne (Ind.) shops of the Pennsylvania Lines West. From 1900 to 1903 he held a similar position in the Altoona (Pa.) shops of the Pennsylvania. From 1903 to 1907 he was successively motive power inspector of the Pennsylvania at Buffalo, N. Y.; assistant master mechanic at Verona, Pa., and Harrisburg, Pa.; general foreman at Columbia, Pa., and Enola, Pa. In April, 1907, he was appointed master

mechanic of the Cumberland Valley at Chambersburg, Pa., where he remained up to the time of his recent appointment as superintendent of the Vandalia at Decatur, Ill.

W. D. Beck, superintendent of the Chicago & North Western passenger terminal at Chicago, has been appointed to the staff of the vice-president in charge of maintenance and operation.

F. P. Smith, agent of the Chesapeake & Ohio of Indiana, at Marion, Ind., has been appointed general agent of the Chesapeake & Ohio, with office at Huntington, W. Va., succeeding L. C. Spengler transferred.

F. J. Easley, assistant general manager first district, Chicago, Rock Island & Pacific, has been appointed assistant general manager of the Colorado lines of the Denver & Rio Grande, with headquarters at Denver, Colo.

J. O. Halliday, assistant to general manager of the New York, New Haven & Hartford, at New Haven, Conn., has been appointed superintendent of transportation, with headquarters at New Haven, and his former position has been abolished.

L. K. Redman, general agent of the freight and operating department of the Chicago & Eastern Illinois at Terre Haute, Ind., has been promoted to the position of general agent at Detroit vice W. T. McNamara resigned, and has been succeeded by George W. Bates.

A. J. Davidson, superintendent of the Spokane & Inland Empire, with headquarters at Spokane, Wash., has been appointed acting general superintendent of the Spokane, Portland & Seattle with supervision over the operating and mechanical departments. He will have headquarters at Portland, Ore.

B. A. Campbell, assistant division superintendent of the Southern Pacific at Oakland Pier, Cal., has been appointed assistant superintendent of the Salt Lake division, with headquarters at Ogden, Utah. J. W. Fitzgerald, assistant division superintendent at Dunsmuir, Cal., succeeds Mr. Campbell.

John Burtis Glasgow, trainmaster of the Northern Pacific at Mandan, N. D., has been appointed trainmaster of the Fargo division, with headquarters at Dilworth, Minn., vice G. H. Jacobus transferred. James H. Johnson, trainmaster at Dilworth, has been appointed trainmaster of the St. Paul division, with headquarters at Minneapolis, Minn.

George Dyer, superintendent of the Sandusky and Northern Ohio railway divisions of the Lake Erie & Western, has been appointed general superintendent with headquarters at Tipton, Ind. A. D. Peters has been appointed superintendent to succeed Mr. Dyer as superintendent at Lima, Ohio, and H. L. Stoncifer has been appointed trainmaster of the Peoria division, with headquarters at Lafayette, Ind., effective June 1.

Timothy Wallace Evans, whose appointment as assistant general manager of the New York Central, Lines East of Buffalo, with headquarters at New York, has already been announced in these columns, was born on July 15, 1867, at Morris Run, Tioga county, Pa. He was educated in the common schools, and began railway work June 1, 1883, with the Fall Brook Railway, now a part of the New York Central, as a telegraph operator, at Cedar Run. In December of the same year he was transferred to Wellsboro, Pa., remaining at that place until April, 1888, when he was appointed train despatcher of the same road at Jersey Shore, and about five years later he went as train despatcher to the Beech Creek Railway, which became a part of the Pennsylvania division of the New York Central in 1899. He remained in that position until September, 1901, when he was appointed trainmaster of the Beech Creek district of the Pennsylvania division of the New York Central. In December, 1904, he was made chief trainmaster of the Pennsylvania division, and from January, 1906, to October of the following year he was assistant superintendent of the same division. In October, 1907, he was appointed superintendent of the Rochester division, and in June, 1910, was appointed superintendent of the Buffalo division of the same road. He was promoted in October, 1912, to general superintendent of the Western district, now the Second district of the New York Central, with headquarters at Syracuse, and since May, 1915, with headquarters at Buffalo, which position he held until his recent appointment as assistant general manager of the same road for the Lines East, as above noted.

J. A. Fox, superintendent of the Cincinnati and Ashland divisions of the Chesapeake & Ohio, at Ashland, Ky., has been appointed superintendent of the Clifton Forge division, with headquarters at Clifton Forge, Va.; vice F. S. Rockwell transferred. J. B. Harris, superintendent of the Hinton division, at Hinton, W. Va., succeeds Mr. Fox, and F. S. Rockwell, superintendent of the Clifton Forge division, at Clifton Forge, Va., succeeds Mr. Harris.

F. H. Hemes, chief clerk to the president of the Chicago & North Western, has been appointed superintendent of the North Western passenger terminal at Chicago, vice W. D. Beck, transferred. Mr. Hemes was born at Port Washington, Wis., on September 6, 1883, and entered railway service in the office of the superintendent of the Wisconsin division of the North Western in 1904. In 1906 he was transferred to

the office of the vice-president in charge of operation and maintenance, where he was subsequently made chief clerk. In 1910, when W. A. Gardner was elected president of the North Western, he was made chief clerk.

Traffic

I. P. Spining has been appointed general freight and passenger agent of the Wellsville & Buffalo, with office at Buffalo, N. Y.

The title of Eugene Mock, general freight and passenger agent of the Midland Valley at Muskogee, Okla., has been changed to traffic manager.

Carl Schonfelder, Jr., whose appointment as assistant general freight agent of the Texas & Pacific, with office at Dallas, Tex., has already been announced in these columns, was born at Marshall, Harrison county, Tex., on June 14, 1879. He was educated in the public schools of Marshall, and entered railway service in September, 1894, in the freight traffic department of the Texas & Pacific. He has been continuously in the employ of that road up to the present time, holding various positions in the freight traffic department. At the time of his recent promotion to assistant general freight agent, with headquarters at Dallas, Tex., Mr. Schonfelder was chief rate clerk in the general freight offices at Dallas.

L. A. Schroeder has been appointed general agent for the passenger department of the New York Central at Toledo, Ohio, vice P. D. Warren, resigned.

A. C. Johnson, recently appointed general traffic manager of the Chicago & North Western with headquarters at Chicago, Ill., was born in 1861. He first entered railway service in 1894, as a special agent of the Chicago & North Western. On March 15, 1899, he was appointed general agent with jurisdiction over the state of South Dakota, and from February 12, 1900, to May 1, 1910, he was general agent with headquarters at Winona, Minn., at the same time being general freight and passenger agent of the Pierre, Rapid City & Northwestern, a subsidiary of the Chicago & North Western. From May 1, 1910, to May 26, 1916, he was passenger traffic manager of the North Western, with headquarters at Chicago. As general traffic manager he will continue to have headquarters at Chicago.

L. J. Comstock, traveling freight and passenger agent of the Chicago & Alton at San Francisco, Cal., has been promoted to general agent, traffic department, with headquarters at the same city.

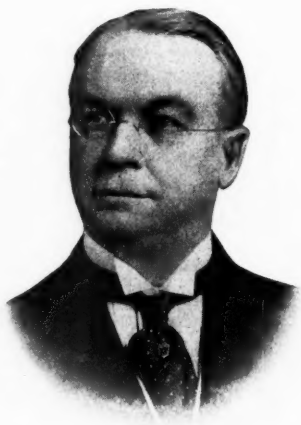
J. F. Osborne, traveling freight agent of the Missouri, Kansas & Texas Railway of Texas, at Fort Worth, Tex., has been appointed commercial agent, with headquarters at Denison, vice F. S. Fisher, resigned.



T. W. Evans



C. Schonfelder, Jr.



A. C. Johnson

L. E. Chalenor, freight traffic manager of the Seaboard Air Line at Norfolk, Va., has been elected chairman of the Southeastern Freight Association, with office in Atlanta, Ga., and he will assume this position on July 1.

John B. Payne, recently appointed general freight agent of the Texas & Pacific, with office at Dallas, Tex., was born on March 24, 1872, at Bowling Green, Ky. He was educated at



J. B. Payne

Ogden College in his native city, and entered railway service early in 1889 as an employee of the Atchison, Topeka & Santa Fe at Topeka, Kan. From November, 1889, to February, 1893, he was in the operating department of the Mexican Central in Mexico. He held various positions in the general freight office of the Texas & Pacific at Dallas, Tex., until February, 1897, when he was appointed commercial agent, with office at Ft. Worth, Tex. He subsequently served as commercial agent at Louisville, Ky.; Birmingham,

Ala., and Chicago, Ill., and as chief clerk to the general traffic manager at New Orleans, La. From January, 1913, to May 15, 1916, he was assistant general freight agent, with office at Dallas, Tex.

Edmund A. Osborne, assistant general manager of the International Railways of Central America, has been appointed traffic manager, with headquarters at Guatemala City, Central America, and the position of assistant general manager has been abolished.

George Cody Kelleher, whose appointment as general passenger agent of the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific,

with office at New Orleans, La., has already been announced in these columns, was born on September 30, 1882, at Little Rock, Ark. He was educated in the public schools of New Orleans, and graduated from high school in 1899. He later attended Tulane University, and began railway work in November, 1900, as a stenographer in the office of the superintendent of the New Orleans & Northeastern at New Orleans. The following April he became ticket stock clerk in the passenger department, and later served consec-



G. C. Kelleher

tively as rate clerk, chief rate clerk and chief clerk in the general passenger department. On September 1, 1913, he was appointed assistant general passenger agent of the New Orleans & Northeastern, the Alabama & Vicksburg, and the Vicksburg, Shreveport & Pacific, which position he held at the time of his appointment as general passenger agent of the same roads, as above noted.

Andrew I. Hays, who has been appointed assistant general freight agent of the Carolina, Clinchfield & Ohio, with office at Johnson City, Tenn., was born on September 2, 1874, at Cold Springs, Ind., and received a high school and college education. He began railway work in December, 1895, and was in the

service of the Queen & Crescent and the Southern Railway, in various capacities until July, 1906, when he went to the Indian Refining Company as traffic manager. In March, 1911, he returned to railway work, and was in the service of the Southern Railway until April 1, 1913, and since that time has been in the service of the Carolina, Clinchfield & Ohio.

Alfred J. Ball, recently appointed foreign freight agent of the Pennsylvania Railroad for the Lines East of Pittsburgh and Erie, as has already been announced in these columns, was born on July 22, 1882, at Philadelphia, Pa., and began railway work in December, 1900, as a stenographer in the office of the manager of the Empire Line at Philadelphia. After serving in various capacities he was promoted in October, 1903, to freight solicitor of the Empire Line. In July, 1908, he became agent of the Philadelphia district, and seven years later was promoted to the newly created position of eastern superintendent of the Empire Line, with office at Philadelphia, which position he held at the time of his recent appointment as foreign freight agent of the Pennsylvania Railroad, as above noted.

Engineering and Rolling Stock

R. C. Brown has been appointed engineer of maintenance of the Salt Lake Route, a new position, with headquarters at Los Angeles, Cal.

F. Williams has been appointed general foreman, locomotive and car departments, of the Wellsville & Buffalo, with office at Blasdell, N. Y.

A. H. McCowan, supervisor of car work of the Canadian Northern lines west of Port Arthur, Ont., has had his authority extended over the eastern lines.

E. C. Keenan, general superintendent of telegraph of the New York Central Lines West of Buffalo, at Chicago, has been appointed general superintendent of telegraph, with headquarters at New York.

J. M. Weir has been appointed division engineer of the northern division of the Kansas City Southern with headquarters at Pittsburg, Kan., with jurisdiction over the road and engineering department, vice A. Leckie and M. A. Box, assigned to other duties, effective June 1.

George M. Ball, Jr., supervisor of the Pennsylvania Railroad at Jersey City, N. J., has been appointed supervisor of the Baltimore division, with headquarters at Washington, D. C. Robert Faries, supervisor at Washington, has been appointed supervisor of the Baltimore division, with headquarters at Baltimore, Md. Jerry Bergan, supervisor at Elmira, N. Y., has been appointed supervisor in the office of the division engineer of the Elmira division, at Elmira. F. J. Potter, supervisor at Bordentown, N. J., has been appointed supervisor in the office of the division engineer of the Trenton division at Trenton, N. J. LeRoy J. Fairbank, supervisor at Erie, Pa., has been appointed supervisor of the Baltimore division, with office at York, Pa. A. E. Preble, supervisor at Camden, N. J., has been appointed supervisor of the Trenton division, with office at Bordentown, and Joseph H. Redding, supervisor at Baltimore, Md., has been appointed supervisor of the Camden Terminal division and the West Jersey & Seashore, with office at Camden.

OBITUARY

P. W. Connor, commercial agent of the Illinois Central at Cincinnati, Ohio, died May 20.

Joseph E. Votaw, assistant general manager of the Memphis, Dallas & Gulf, was killed in a train accident at Nashville, Ark., on May 26. He was born on February 19, 1864, in Wabash county, Indiana, and began railway work in 1882 as agent and operator on the Chicago, Burlington & Kansas City. He served as operator, train dispatcher and trainmaster on a number of roads including the Wabash, St. Louis & Pacific, and the Chicago, Burlington & Quincy until March, 1906, when he was appointed superintendent of the Chicago, Burlington & Quincy at Brookfield, Mo. In 1908 he was appointed trainmaster on the Chicago, Rock Island & Pacific at Little Rock, Ark., and later was general superintendent of the Marshall & East Texas. In 1911 he was made vice-president of that road. He has been with the Memphis, Dallas & Gulf since October 1, 1915.

Equipment and Supplies

LOCOMOTIVES

THE UNION RAILROAD has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE ILLINOIS TERMINAL RAILROAD has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

THE RUSSIAN GOVERNMENT is reported to have ordered 70 additional narrow gage locomotives from the American Locomotive Company.

THE MARYLAND STEEL COMPANY, Sparrows Point, Md., has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE SNOQUALMIE FALLS LUMBER COMPANY, operating in the state of Washington, has ordered 2 Mikado type locomotives from the Baldwin Locomotive Works.

THE LEHIGH VALLEY, reported in the *Railway Age Gazette* of May 12 as having issued inquiries for 40 Santa Fe and 30 Pacific type locomotives for freight service, has ordered these locomotives from the Baldwin Locomotive Works.

THE CUBAN CENTRAL has ordered 7 superheater Consolidation locomotives from the American Locomotive Company. These locomotives will have 18 by 24-in. cylinders, 50-in. driving wheels, and a total weight in working order of 126,000 lb.

THE EGYPTIAN STATE RAILWAYS has ordered 24 six-wheel (0-6-0) locomotives from the American Locomotive Company. These locomotives will have 10 by 14-in. cylinders, 29-in. driving wheels, and a total weight in working order of 35,000 lb.

THE UNITED RAILWAYS OF HAVANA has ordered 3 superheater Consolidation locomotives from the American Locomotive Company. These locomotives will have 20 by 26-in. cylinders, 50-in. driving wheels, and a total weight in working order of 159,000 lb.

THE NIPPON SEIKOSHO RAILWAY (China) has ordered one four-wheel tank locomotive from the American Locomotive Company. This locomotive will have 13 by 18-in. cylinders, 34½-in. driving wheels, and a total weight in working order of 58,000 lb.

THE SEABOARD AIR LINE was noted in last week's issue as having ordered 5 Mountain type locomotives from the American Locomotive Company. These locomotives will have 27 by 28-in. cylinders, 69-in. driving wheels, and a total weight in working order of 316,000 lb.

THE COMPANIA GENERAL DE ASFALTOS Y CEMENTOS ASLAND (Spain) has ordered one six-wheel tank locomotive from the American Locomotive Company. This locomotive will have 9 by 14-in. cylinders, 27-in. driving wheels, and a total weight in working order of 35,000 lb.

THE SOUTHERN UTAH has purchased a "McKeen Mallet" motor car from the McKeen Motor Company, Omaha, Neb. The motor car is 55 ft. long and generates 300 hp. It will take the place of a Consolidation type locomotive between Price, Utah, and Hiawatha, an 8-mile stretch of continuous 2½ to 3 per cent grades, with heavy curvature and a maximum grade of 4.9 per cent.

THE CHESAPEAKE & OHIO, reported in the *Railway Age Gazette* of May 5 as having issued inquiries for 25 to 50 Mallet type locomotives, has ordered 25 superheater Mallet (2-6-6-2) type locomotives from the American Locomotive Company, and 25 from Lima Locomotive Corporation. The locomotives ordered from the American Locomotive Company will have 22 and 35 by 32-in. cylinders, 56-in. driving wheels, and a total weight in working order of 435,000 lb.

FREIGHT CARS

THE UNION PACIFIC has ordered 150 coal cars from the Big Bend Coal Mining Company.

THE ILLINOIS CENTRAL has ordered 300 stock cars from the American Car & Foundry Company.

THE RUSSIAN GOVERNMENT has ordered 1,000 steel cars for transporting troops and supplies from the Seattle Car & Foundry Company.

PASSENGER CARS

THE CENTRAL OF GEORGIA is asking prices on 4 sleeping cars.

THE UNITED RAILWAYS OF HAVANA have issued inquiries for 3 third-class cars.

THE CHICAGO & NORTH WESTERN is inquiring for 10 baggage cars, 15 vestibule smoking cars, 24 coaches, 5 combination baggage and mail cars, and 3 postal cars.

THE SEABOARD AIR LINE, reported in the *Railway Age Gazette* of April 28 as having issued inquiries for 15 all-steel express cars, has ordered these cars from the Pressed Steel Car Company.

IRON AND STEEL

THE NEW YORK CENTRAL has ordered 850 tons of steel from the Fort Pitt Bridge Works for grade crossing elimination work at Niagara Falls, N. Y.

SIGNALING

THE SOUTHERN RAILWAY has awarded a contract to the General Railway Signal Company for the equipment of 23 miles of double-track a.c. automatic block signals between Whittle and Danville, Va.

THE UNION PACIFIC will install automatic block signals between Salina, Kan., and Ellis, 117 miles, at an estimated cost of \$175,000. This will complete the automatic block signal system between Kansas City, Mo., and Ellis, 303 miles.

THE OAHU RAILWAY & LAND COMPANY, Honolulu, H. I., has recently purchased from the General Railway Signal Company complete materials for 23 miles of single-track d.c. automatic block signals, employing the "absolute-permissive" system.

THE MISSOURI PACIFIC has purchased miscellaneous materials for a mechanical interlocking plant with power distant signals at a crossing with the Achison, Topeka & Santa Fe at Nepeta, Colo. The machine is a Saxby & Farmer comprising 19 working levers and five spare spaces. The General Railway Signal Company will furnish the material.

THE SAN PEDRO, LOS ANGELES & SALT LAKE is to install automatic block signals this summer on 286 miles of its line, at a cost of \$400,000. In this connection it is stated that no passenger has been killed in a train accident on the road in nine years. In other words, the stable door is to be locked before the horse is stolen. The road to be equipped is that between Los Angeles, Cal., and Riverside, 56 miles; Salt Lake City and Lynndyl, Utah, 118 miles; and Moderna to Rox, Nev., 112 miles.

RAILWAY EXTENSION IN NORTHERN COLOMBIA.—The Santa Marta Railway, which is now owned by the Department of Magdalena, is to be purchased by the Colombian Government. It is the intention of the government to extend the railway to a point on the Magdalena river toward the region of the River Ariguani or other point, which new surveys may indicate as most desirable.

A WASHED-OUT TITLE.—Uncle Sam has fitted up a traveling exposition to represent the Washington executive departments; but why he should give it the washed-out title of "the safety-first train" is a mystery. The interest shown in government exhibits at the various world's fairs justifies this effort to bring a compact view of government work to the very doors of the people. This train, which is to stop for one or two days at every considerable city, should have a marked educational value.—*New York Evening Post*.

Supply Trade News

M. J. Fox, assistant signal engineer of the Chicago, Burlington & Quincy, has become associated with the signal department of the Railroad Supply Company, Chicago, effective June 1.

James A. Nolan, for some years superintendent of the track tool department of Hubbard & Co., Pittsburgh, has resigned to accept a similar position with the Oliver Plow Company, Hamilton, Ontario.

W. E. Greenwood has been appointed assistant manager of the railway sales and fuel oil department of the Texas Company, vice L. F. Jordan resigned, effective June 1. Mr. Greenwood's headquarters will be at 17 Battery Place, New York City.

Oscar F. Ostby, general sales agent of the Commercial Acetylene Railway Light & Signal Company, New York, has resigned from that position, effective June 1. Mr. Ostby is the president of the Railway Supply Manufacturers' Association, and has been active in its affairs and those of the International Acetylene Association for many years.

The Pennsylvania Tank Car Company and the Pennsylvania Tank Line, Sharon, Pa., announce the election of L. F. Jordan as president, and A. S. Maitland as treasurer, effective June 1.



L. F. Jordan

Mr. Jordan, the newly elected president, is a man of wide experience both as a railroad and supply man. He first entered railway service in 1895, as a clerk in the stores department of the Missouri Pacific at Kansas City, Kan., later being promoted to storekeeper in the same office. From 1901 to 1902 he was clerk in the office of the purchasing agent of the Kansas City Southern at Kansas City, Mo. From the latter date until 1905 he was clerk in the office of the general manager of the Kansas City Southern at Kansas City, Mo. From Kansas

City he went to Denver, Colo., where he was general storekeeper of the Denver & Rio Grande until 1905, when he returned to Kansas City as purchasing agent of the Kansas City Southern. He left railroad service in 1912 to become assistant manager of the railroad and fuel oil department of the Texas Company, Chicago. He severed his connections with this company on June 1.

At a meeting of the board of directors of the American Brake Shoe & Foundry Company, New York, May 17, Otis H. Cutler, president of the company, was elected chairman of the board and William G. Pearce, vice-president, was elected president. James S. Thompson, William S. McGowan and Clifton D. Pettis were elected vice-presidents.

The Central Foundry Company, New York, announces that owing to the increasing importance of its western business, a vice-president of the company will maintain an office in Chicago, and that C. C. Todd, who for many years has represented the company in the west and who about a year ago was elected a vice-president of the company, will open the Chicago office on July 1.

The Algoma Steel Corporation is constructing a building at Sault Ste. Marie, Ont., for two 75-ton, open-hearth furnaces, 120 ft. by 198 ft., arranged for two 125-ton cranes on the tapping side, and for two 40-ton cranes on the charging side. The structure will consist of a steel frame covered with corrugated

sheeting. The Hamilton Bridge Company, Hamilton, Ont., has the contract for the work.

Daniel J. Higgins has terminated his connection with Fairbanks, Morse & Co., and has organized the firm of Higgins & Co., with offices in the McCormick building, Chicago, for the sale of the following railway specialties: Venn-Severin oil engines, Saunders corrugated car stoppers, Poage water columns, Economy switch stands and Samson anchors. For the past five years Mr. Higgins has been in the railroad sales department of Fairbanks, Morse & Co., Chicago, and previous to that was in the operating department of the Illinois Central in various capacities.

Greenville Steel Car Company.

The Greenville Steel Car Company, Greenville, Pa., as noted briefly in last week's issue, has recently been reorganized and F. L. Fay, formerly general manager, has been elected president

and has acquired the controlling interest in the business. James G. Dimmick has been elected vice-president. The company is enlarging its plant to handle more business.

Frank L. Fay, the new president of the company, has been treasurer and general manager of the Greenville Steel Car Company and its predecessor, the Greenville Metal Products Company, since 1910. He was born at Cleveland on July 18, 1869, and was educated in the public schools of that city. He entered railway service in 1888 when he became a night watchman at the Cleveland shops of the Valley Railroad, now part of the Baltimore & Ohio. He also served for a while as an operator on that road. In 1889 he went to the New York, Chicago & St. Louis, serving for a while as a station agent and three years in the car accountant's office. From 1903 to 1910 he was car accountant on the Bessemer & Lake Erie. As noted above, he left railway service in the latter year to engage in the railway supply business.

James G. Dimmick, the new vice-president, was for some time in the construction department of the Pere Marquette. He has been engaged for some years in car construction work and in his new position will have charge of the production department and factory management.



F. L. Fay



J. G. Dimmick

The Ogle Construction Company has received the following contracts for the erection of coaling stations: a 300-ton coaling station for the Illinois Central at Cecilia, Ky.; a coal and coke station for the Boston & Maine, at Salem, Mass.; a 300-ton coaling station for the Missouri Pacific, at Prairie du Rocher, Ill.; coaling stations for the Chicago, Burlington & Quincy, at Buda, Yates City and Denrock, Ill., and the remodeling of the coaling station of that road at Mendota, Ill.; a 300-ton station

at Ihlen, Minn.; a 400-ton station at Minot, N. D., and a 300-ton station at Sioux City, Ia., for the Great Northern.

Charles R. Shepley and William L. Johnson have formed the firm of Shepley & Johnson, general contractors and engineers, with offices in the Pioneer building, St. Paul, Minn. Until recently Mr. Shepley was chief engineer of the George J. Grant Construction Company, of St. Paul, and of the Emerson-Brantingham Company, of the same city. Mr. Johnson is vice-president and general manager of the American Dump Car Company of St. Paul. For several years he was associated with the Winston Bros. Company, railway contractors, of Minneapolis, and for the past three years has been a member of the firm of Hoy & Johnson, of St. Paul.

Six members of the sales organization of the Commercial Acetylene Railway Light & Signal Company, New York, several of whom are leaving the service of the company, have presented to Charles E. Lee, their general manager, in token of their friendly association with him for many years, the following tribute attractively lettered and framed:

It's the kindly hearts of earth that make
This good old world worth while;
It's the lips with tender words that wake—
The care erasing smile.

To a man: Charles E. Lee, our general manager and friend, in deep appreciation of his unselfish and true friendship—the guiding influence of his fairness and sincerity. We are all better prepared to meet the problems of life for having known you and worked with you, and will cherish a continuation of your friendship wherever we go. The six signers are Oscar F. Ostby, general sales agent; E. T. Sawyer, R. J. Faure, David Ahldin, C. A. McCune, Chas. S. Tieman.

W. G. Cook, railroad representative of the Garlock Packing Company, Palmyra, N. Y., with headquarters at Cleveland, Ohio, has been appointed assistant to the general sales manager of the company. Mr. Cook started his business career as a yard clerk for the Cincinnati, Hamilton & Dayton at Toledo, Ohio, in September, 1904. He was later a stenographer in the operating and mechanical departments of the same road. From September, 1905, to September, 1907, he was successively stenographer in the accounting department of the Detroit, Toledo & Ironton at Toledo, Ohio, and pay roll clerk in the same department of the Ann Arbor at Detroit, Mich. From Detroit he went to Frankfort, Ind., as secretary to the general superintendent of the Toledo, St. Louis & Western. Between 1908 and 1912 he was in the service of the Clover Leaf and the Chicago & Alton at Chicago, as secretary to the general manager and secretary to the vice-president and general manager. From 1912 to 1913, he was secretary to the president of the Chicago & Alton. After leaving the Alton, Mr. Cook became railroad representative of the Garlock Packing Company, first with office at Chicago, and since May, 1914, with office at Cleveland.

TRADE PUBLICATIONS

STONE TOOLS.—The Chicago Pneumatic Tool Company has issued bulletin No. 192, which describes and illustrates the various pneumatic tools used in the cutting, surfacing and quarrying of building stones. Numerous other tools and accessories are also included.

GAS ENGINES.—Bulletin No. 405 recently issued by the National Transit Pump & Machine Company, Oil City, Pa., deals with the company's types GH4A and GH4B, four-cycle, single-cylinder horizontal gas engines. These engines are supplied in 50, 75, 100 and 150 h.p.

CONCRETE POSTS.—The Ohio Post Mold Company, Toledo, Ohio, has issued a 24-page pamphlet describing the posts made with its machine. Considerable space is given the method of manufacture, the shipping and placing of the posts, and the attaching of the wire fencing.

TIE TAMPING OUTFIT.—The Ingersoll-Rand Company has issued a bulletin describing the methods used and the results obtained with pneumatic tie tampers as employed on steam and electric railways. The booklet contains numerous illustrations showing how the tampers are used and illustrating the various parts of the equipment.

Railway Construction

BEARDEN & OUACHITA RIVER.—This road is extending its line three miles to Woodberry, Ark. The work involves light grading and the construction of several timber bridges, one 112 ft. in length, six 32 ft. long, and five 16 ft. long. P. C. Cotrell, of Bearden, Ark., has the contract, and has completed about 75 per cent of the work. B. F. Gray, Bearden, Ark.

BEAVER VALLEY (ELECTRIC).—This company, recently incorporated, proposes to build an electric railway from Baker, Mont., via Webster, to Ekalaka, Mont., 50 miles. It is estimated that from 10,000 to 15,000 cu. yd. of material will be handled per mile. The contract for the grading work will be awarded by August 1. The structures contemplated include a power house, two substations and a 150-ft. trestle. The final location has been made for 25 miles of the line, and the right-of-way has been secured. A. H. Webster, president, Webster, Mont.; H. G. Hoag, chief engineer, and Charles Bese, general manager, Ekalaka, Mont.

BOSTON ROADS.—The Massachusetts Legislature has put over until next year the terminal commission's proposal that the state build and operate a belt line freight railroad around Boston's outskirts at an initial cost of \$10,000,000. (April 21, p. 926.)

CAROLINA RAPID TRANSIT.—Plans are being made to build electric lines to connect Spartanburg, S. C., Union Laurens, Clinton and Woodruff. The proposed route will cross two rivers and two large creeks. The plans include building terminals, also a hydro-electric power plant. The company expects to develop a traffic in coal, cotton, cottonseed products, machinery, general merchandise and farm products. J. F. Jacobs & Co., Clinton, S. C., may be addressed.

CUMBERLAND VALLEY.—This company is carrying out improvements to include double tracking work, with some slight revision of line and grade on 6 miles between Newville, Pa., and a point west of Oakville. Just west of Newville there are two cuts, the graduation of which has been let to the Mason & Hanger Company, Richmond, Ky., involving the excavation of about 183,000 cu. yd., and the placing of same in embankment, extending eastward from the cuts, through the borough limits of Newville. The balance of the work is light and is being carried out by company forces. A 24-ft. span concrete arch bridge, containing 1,750 cu. yd., has been built at the eastern end of Newville, and a similar arch is under construction which will require 1,000 cu. yd. at the western end. Several other small drainage culverts, containing in all about 1,800 cu. yd., will be built.

DETROIT, BAY CITY & WESTERN.—This company is building an extension southeasterly from Peck, Mich., its present terminal, to Pt. Huron, 32 miles. About 7,500 cu. yd. of material is being handled per mile; the maximum grade is 1 per cent, and the maximum curvature 4 deg. About 40 per cent of the grading has been completed. Track laying will commence about June 15, and one 700-ft. trestle and 12 small bridges, varying from 12 ft. to 30 ft. in length, will be constructed. The trestle will involve the placing of 3,000 cu. yd. of concrete, the erection of one 100-ft. girder span and two 50-ft. girders, and the utilization of about 300,000 ft. bm. of lumber. A depot and a roundhouse are contemplated at Pt. Huron, and a new terminal depot at Bay City, to cost about \$60,000. The city of Pt. Huron is raising \$40,000 to help defray the expense of these improvements. William N. Boyd, chief engineer, Bay City, Mich.

MEXICAN ROADS.—According to press reports, Governor Salvador Alvarado, of Yucatan, has organized a company to build railway lines in the southeastern section of Mexico. A comprehensive plan of improvement will be carried out. The Mexican government, also the state government and capitalists of Yucatan, will finance the project.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has awarded contracts on sections of Route No. 8, the Fourteenth Street-Eastern Rapid Transit subway. The two sections just awarded are Nos. 1 and 5, and went respectively to Booth & Flinn, Ltd., at \$2,528,618, and MacArthur

Brothers Company at \$1,336,949, the lowest bidders in each case. Bids have been opened for building Section No. 2, and the contract will be let at once, the Degnon Contracting Company being the lowest bidder, at about \$1,972,000. (May 26, p. 1159.)

Bids were opened recently by the commission for the construction of Route No. 31, the Livonia avenue elevated extension of the Eastern Parkway subway in the borough of Brooklyn. Route No. 31 is a two-track line, and runs from a connection with the Eastern Parkway line at Buffalo avenue, over East Ninety-eighth street and Livonia avenue to New Lots avenue, the end of the line. Dennis E. Conners, New York, was the lowest bidder at about \$1,376,000, and it is expected that the contract will be awarded within a few days.

NORTHWESTERN CONNECTING (ELECTRIC).—See Northwestern Pennsylvania.

NORTHWESTERN PENNSYLVANIA (ELECTRIC).—Under the name of the Northwestern Connecting, a line is to be built from Cambridge View, Pa., south to Venango, 3.6 miles. A contract for the grading work has been let to L. V. Metz, Erie, Pa. The maximum grade will be 2 per cent, and the maximum curvature 5 deg. The bridges include one 40-ft. girder span and one 50-ft. girder span. James Briggs, chief engineer.

PELHAM & HAVANA.—Work was completed recently on an extension from Darsey, Fla., southwest to Havana, 6 miles. This company operates 19.3 miles from Cairo, Ga., southwest to Darsey, Fla., and, it is said, expects to build an extension from the present northern terminus at Cairo, Ga., north to Pelham, about 20 miles. (March 3, p. 418.)

PIEDMONT & NORTHERN (ELECTRIC).—Regarding the report that work is to be carried out on the gap in this company's lines between Gastonia, N. C., and Spartanburg, S. C., an officer writes that an engineering party is now making surveys south from Gastonia, but no plans have been made for extending the line.

SAN ANTONIO & AUSTIN INTERURBAN.—This company, organized early in the year, expects to begin work soon on an electric road from San Antonio, Tex., by way of New Braunfels and San Marcos, to Austin, 78 miles. Vories P. Brown, president, and W. B. Tuttle, chief engineer, San Antonio, Tex.

ST. JOHN & QUEBEC.—It is understood that the Canadian Government Railways, which now operates this railway under agreement to lease, intends to build a line from a point on the St. John & Quebec, north of Fredericton, N. B., to Vanceboro, or some other point on the international boundary, to provide a direct connection with the Maine Central. Nothing definite has yet been decided regarding the construction of this line.

SALEM & PENNSGROVE TRACTION.—Contracts have been let to Stern & Silverman, Pugh & Hubbard and W. W. Hepburn for building from Salem, N. J., north via Pennsville to Pennsgrove, 14 miles. J. Elliott Newlin, president, Philadelphia (December 31, p. 1262).

SNOQUALMIE FALLS LUMBER COMPANY'S ROAD.—This company has awarded a contract to Bruce, Nettleton & Eschbach, Seattle, Wash., for the construction of a six-mile logging railroad out of Snoqualmie, Wash. The maximum grade is three per cent compensated, and the maximum curvature 12 deg. About 30,000 cu. yd. of material will be handled. Work on the road is now under way. W. W. Warren, manager, 1119 White building, Seattle, Wash.

UNION PACIFIC.—This company has authorized the expenditure of approximately \$1,000,000 for improving the Kansas City-Denver line. New 90-lb. rail and ballast will be placed, heavier bridges erected and automatic block signals will be installed between Salina, Kan., and Ellis, completing the automatic block signal system between Kansas City and Ellis, 300 miles.

WHEELING & EASTERN.—This company plans to build a railroad from Wheeling, W. Va., via Wheeling creek and Ten Mile creek in Greene county, Pa., to the Monongahela river at McCann's Ferry, Pa. I. M. Scott, Wheeling, and C. D. Ogden are said to be interested.

WHEELING COAL RAILROAD.—A charter has been granted this company to build a railroad from a junction with the Wheeling

Terminal Railway in Wheeling, W. Va., along Wheeling creek, to a point on the Pennsylvania-West Virginia state line near Majorsville. B. V. Sommerville, Pittsburgh, Pa., may be addressed.

RAILWAY STRUCTURES

ANAHEIM, CAL.—The Atchison, Topeka & Santa Fe will rebuild a bridge over the Santa Ana river to replace a structure washed out by high water. The bridge will consist of three 80-ft. girder spans on concrete abutments and piers. Steel will be furnished by the American Bridge Company. This work has not yet been formally authorized.

AUSTIN AND SOUTH BAKER, ORE.—The Sumpter Valley is erecting a new four-stall roundhouse at Austin, and a new storehouse in connection with its shops at South Baker.

CALIENTE, NEV.—A concrete arch to weigh 11,000 tons and to cost \$60,000 will be built on the line of the Salt Lake Route, at the intersection of Sawmill Canyon and Clover Creek, in Nevada. Works on the arch will be begun shortly. The arch will be about 93 ft. long, 23 ft. high and extend 18 ft. below the stream bed, and will be capable of sustaining 73,680 tons.

COATESVILLE, PA.—The Philadelphia & Reading has given a contract to Edward F. Fonder, Philadelphia, Pa., for building a new station at Coatesville. The structure will be built of stucco covered brick and will have a stone foundation. It will be 26 ft. 6 in. by 72 ft.

DANVILLE, ILL.—The Chicago & Eastern Illinois is doing preliminary work on a new passenger station at Danville, Ill., to cost about \$175,000, including trackage and sheds. It is also completing car shops partially built in 1913 at a cost of about \$100,000.

INDIANAPOLIS, IND.—The Pittsburgh, Cincinnati, Chicago & St. Louis has awarded a contract for the construction of a new freight terminal to Dunn & McCarthy, Chicago, Ill. The project includes the laying of 55 miles of track, and the construction of a roundhouse, coaling plant, water station, inspection pits, ash pits, sandhouse, oil house, power house, yard office, scales and interlocking towers. (April 21, p. 928.)

JAMAICA, N. Y.—The Long Island Railroad is now building a new station at the intersection of Jamaica avenue and the main line of the Long Island west of Jamaica. The estimated cost of the station is \$12,500. The plans call for the construction of concrete platforms, with the necessary shelter sheds, etc. The platforms will be 10 ft. wide and 300 ft. long, and there will be an enclosed waiting room on the westbound side 18 ft. by 28 ft., with shelter extending west about 90 ft.; also a shelter on the eastbound side 8 ft. by 24 ft. Part of the work will be carried out by the railroad company with its forces and part by John T. Woodruff & Son, contractors, Long Island City.

NEW HAVEN, CONN.—The Connecticut Company has given a contract to The J. G. White Engineering Corporation, New York, for the engineering and construction of a new steam power plant at New Haven. The plans for this power station are being prepared for an ultimate capacity of 100,000 kw., and construction work on the foundation has been started. This plant will take the place of the company's old direct current station at New Haven, and probably two sub-stations will be built in New Haven for local distribution of current to the company's lines.

NEW YORK.—Bids for the construction of station finish on seven stations of sections Nos. 7 to 11 inclusive of Route No. 5, the Lexington avenue subway in the borough of Manhattan, were opened recently by the Public Service Commission, First district. This part of the line extends from Forty-third to One Hundred and Sixth street. The lowest bidder was John B. Roberts, New York, who offered to do the work for about \$266,000. The commission will open bids soon for station finish on Sections Nos. 12 to 15 inclusive, extending from One Hundred and Sixth to One Hundred and Fifty-seventh street.

NISQUALLY, WASH.—The State of Washington and the Northern Pacific will construct a concrete viaduct over the latter's

tracks consisting of three 40-ft. spans and seven 20-ft. spans, which will involve the placing of 1,280 cu. yd. of concrete. The cost of the structure has been estimated at \$12,000. The plans are not yet ready for distribution. H. G. Porak, assistant state highway commissioner, Olympia, Wash.

OCEANSIDE, CAL.—The Atchison, Topeka & Santa Fe is constructing new bridges over the Santa Margarita and San Luis Rey rivers, to replace those washed out by high water. The bridge over the Santa Margarita river will consist of four 105½-ft. deck girder spans on four concrete piers and concrete abutments. The contract for the substructure has been awarded to the Sharp and Fellows Construction Company, Los Angeles, and the contract for the steel to the American Bridge Company. Work on the foundation has just begun, and the erection of the superstructure will be done by the Santa Fe's own forces. The bridge over the San Luis Rey river will consist of four 100-ft. steel spans on concrete piers and abutments. The Sharp and Fellows Construction Company has the contract for the substructure and the American Bridge Company is furnishing the steel. Erection work will be done by the railroad's own forces. G. W. Harris is chief engineer of the Coast Lines, at Los Angeles, Cal.

PORT READING, N. J.—Contracts were let recently for building an additional pier at Port Reading to facilitate the unloading of coal from cars received from the Philadelphia & Reading. The pier is to be equipped with a car dumper having a capacity of about ten thousand tons a day. The Atlantic, Gulf & Pacific Company, New York, has the contract for the dredging and embankment work, and the McMyler-Interstate Company has the contract for the car-unloading machinery. A contract has also been let to the Surety Engineering Company, Inc., New York, for building a thawing plant with a capacity of 44 cars at Port Reading. It is expected that both these improvements will be completed and ready for operation by the end of the year.

SACRAMENTO, CAL.—The Northern Electric will erect a bridge over the American river here to consist of three riveted steel spans, each 200 ft. in length, resting on concrete piers placed by the pneumatic process. Bids were received on the piers on June 1, and steel has already been purchased. The bridge will cost about \$125,000. J. D. Galloway, engineer, First National Bank building, San Francisco, Cal.

SAN JUAN CAPISTRANA, CAL.—The Atchison, Topeka & Santa Fe contemplates the construction of a bridge over Trabuco creek in place of a bridge destroyed by high water. The work involves the erection of two 90-ft. girder spans, the filling of 680 ft. of trestle, and the construction of concrete abutments and one concrete pier. A 650-ft. pile and timber dike will also be built to protect the structure. The improvements have not yet been formally authorized, but if carried out will cost about \$50,000.

STEWARTVILLE, MINN.—The Chicago Great Western has awarded a contract to T. S. Leake & Company, Chicago, for rebuilding the station at Stewartville. The building will be of frame construction, 24 ft. by 80 ft., and will cost about \$5,000.

SUPERIOR, WIS.—The Great Northern is extending 19 stalls of its roundhouse 16 ft., and is making an addition to the boiler room of its power-house. The total cost of the work will amount to about \$30,000.

TWO HARBORS, MINN.—The Duluth & Iron Range will commence the erection of a car repair shop soon. It will be a one-story, steel frame structure, 275 ft. by 310 ft., with concrete block walls. The contract for the foundation work has been awarded to Strom Brothers of Two Harbors, and the steel work has been ordered from the American Bridge Company. No contract has yet been let for the superstructure. W. A. Clark, chief engineer, Duluth, Minn.

VANCOUVER, B. C.—The Canadian Northern Pacific will erect a \$1,000,000 freight and passenger terminal with facilities for 127 cars. A freight shed, 800 ft. by 40 ft., and a roundhouse will also be erected. The grading work, which involves the handling of 4,000,000 cu. yd. of material, is well advanced. Approximately 130,000 ft. of track will be laid. Bids for the construction work will be called for in a week or two. M. H. MacLeod, general manager, Canadian Northern, Winnipeg, Man.

Railway Financial News

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—The Public Utilities Commission of Ohio has approved of an issue of \$1,800,000 Cincinnati, New Orleans & Texas Pacific equipment trust 4½ per cent bonds, series D, dated June 1, 1916, to be sold at 98½. The bonds are to be secured by equipment, the total cost of which is approximately \$2,084,500. This equipment consists of 4 switch engines, 5 passenger engines, 22 all-steel passenger-train cars and 1,500 steel center sill box cars.

NEW YORK CONNECTING.—Arrangements have been made for the sale to J. P. Morgan & Co. and Kuhn, Loeb & Co. of \$8,000,000 additional 4½ per cent first mortgage bonds. Previously there had been \$16,000,000 of these bonds sold.

SOUTHERN RAILWAY.—Drexel & Co., Philadelphia, have bought \$4,700,000 4½ per cent equipment trust certificates, series T, of the Southern Railway, and are offering the certificates to the public at a price to yield about 4.45 per cent. The certificates are secured by equipment costing approximately \$5,633,000.

SUNDAY TRAINS IN SCOTLAND.—The North British is practically the only Scottish railway company which runs any trains on Sundays, other than the connections with England. Many of the North British Railway Sunday trains have now been withdrawn.

MUSIC BY THE BAND.—Besides fostering athletics among its employees, the Erie Railroad is now going in for music. Brass bands have been organized at Susquehanna, Salamanca, Hornell, Huntington, Dunmore, Jersey City, Buffalo and New York. At the New York general office there is a band of 61 pieces. The company has provided instruments and uniforms for eight bands, in which there are 400 musicians. Marches have been dedicated to each grand division.

LONG ISLAND OFFERS PRIZES FOR YOUNG FARMERS.—The Long Island is organizing three "exclusive" clubs among boys and girls along its lines. They are the Cauliflower Club, the Potato Club and the Preserving Club. The requirement for admission to the first two is a half acre of land and willingness to work under a warm sun against the attacks of weeds and worms. Twelve jars of twelve fruits is the card of admission to the Preserving Club. When the summer is over the members of these exclusive clubs will have not only an enviable coat of tan, but a crop of potatoes and freckles, and perhaps one of the prizes offered by Ralph Peters, president of the road.

NORWEGIAN RAILWAY SCHEME.—At a recent important conference, attended by government, municipal, railway and other interests, the subject of a new line between the south coast of Norway and the capital was discussed, and it now looks as if the scheme would materialize. The proposal is that the line should run from Christiania to Kristianssand, in the south, and connect by steamship service with Denmark. The Danish port suggested is Hirtshels, on the west coast of Jylland. At present Hirtshels does not possess the requisite port accommodation and facilities, and it also lacks adequate inland communications, but as the Danish government seems to be interested in the scheme it is not expected that there will be any serious obstacle to the provision of all that may be necessary. With passenger boats capable of 16 knots, the distance from Kristianssand, in Norway, to Hirtshels, in Denmark, could be traversed in five hours. The route would reduce the journey from Christiania to Paris by four hours, the distance from Christiania to South Shields would be about 38 miles shorter than via the Bergen route, and the journey from Christiania to London would be reduced from 46¾ hours, via Bergen, to 41¼ via Kristianssand. Apart from foreign communications, the proposed railway would be a boon to the towns of southern Norway, which are greatly in need of improved communications, and it is believed, therefore, that the government will support the scheme, especially as the cost would not be prohibitive.